**Supplementary Material**

**Data in Tabular Form**

uc is the centreline liquid velocity

**Glass particles**

**0.5 mm particles**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| *r/R* | *u/uc* | *u'/uc* | *r/R* | *w'/uc* |
| 0.985 | 0.62 | 0.088 | 0.968 | 0.051 |
| 0.976 | 0.62 | 0.089 | 0.942 | 0.053 |
| 0.968 | 0.66 | 0.085 | 0.924 | 0.047 |
| 0.959 | 0.66 | 0.085 | 0.907 | 0.048 |
| 0.942 | 0.69 | 0.082 | 0.837 | 0.045 |
| 0.924 | 0.72 | 0.078 | 0.767 | 0.044 |
| 0.907 | 0.75 | 0.078 | 0.697 | 0.042 |
| 0.837 | 0.81 | 0.080 | 0.558 | 0.038 |
| 0.767 | 0.85 | 0.071 | 0.418 | 0.031 |
| 0.697 | 0.88 | 0.066 | 0.348 | 0.032 |
| 0.628 | 0.89 | 0.066 | 0.209 | 0.030 |
| 0.558 | 0.91 | 0.062 | 0.139 | 0.027 |
| 0.488 | 0.94 | 0.059 | 0.069 | 0.025 |
| 0.418 | 0.95 | 0.055 | -0.001 | 0.026 |
| 0.348 | 0.96 | 0.050 |  |  |
| 0.279 | 0.97 | 0.050 |  |  |
| 0.209 | 0.99 | 0.047 |  |  |
| 0.139 | 0.99 | 0.042 |  |  |
| 0.069 | 1.01 | 0.040 |  |  |
| -0.001 | 1.00 | 0.039 |  |  |
| TABLE C-1. Liquid data 0.5 mm, *Re* = 192,970, 0.6% V/V, uc =3.04 m s-1 | | | | |
|  |  |  |  |  |

|  |  |  |
| --- | --- | --- |
| *r/R* | *u/uc* | *u'/uc* |
| 0.948 | 0.60 | 0.089 |
| 0.931 | 0.64 | 0.084 |
| 0.913 | 0.68 | 0.084 |
| 0.842 | 0.76 | 0.079 |
| 0.771 | 0.80 | 0.075 |
| 0.700 | 0.83 | 0.076 |
| 0.629 | 0.86 | 0.072 |
| 0.487 | 0.90 | 0.065 |
| 0.345 | 0.94 | 0.053 |
| 0.203 | 0.97 | 0.044 |
| 0.000 | 0.99 | 0.032 |
| TABLE C-2. Solid data 0.5 mm, *Re* = 192,970, 0.6% V/V, uc =3.04 m s-1 | | |
|  |  |  |

**1 mm particles**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| *r/R* | *u/uc* | *u'/uc* | *r/R* | *w'/uc* |
| 0.986 | 0.59 | 0.091 | 0.943 | 0.052 |
| 0.978 | 0.60 | 0.089 | 0.926 | 0.050 |
| 0.969 | 0.62 | 0.083 | 0.856 | 0.045 |
| 0.961 | 0.65 | 0.086 | 0.786 | 0.046 |
| 0.943 | 0.69 | 0.082 | 0.716 | 0.043 |
| 0.926 | 0.71 | 0.081 | 0.577 | 0.038 |
| 0.856 | 0.79 | 0.078 | 0.507 | 0.035 |
| 0.786 | 0.83 | 0.070 | 0.437 | 0.033 |
| 0.716 | 0.86 | 0.067 | 0.367 | 0.030 |
| 0.647 | 0.88 | 0.066 | 0.297 | 0.029 |
| 0.577 | 0.91 | 0.060 | 0.228 | 0.026 |
| 0.507 | 0.92 | 0.055 | 0.158 | 0.026 |
| 0.437 | 0.94 | 0.057 | 0.088 | 0.025 |
| 0.367 | 0.96 | 0.049 | 0.000 | 0.024 |
| 0.297 | 0.97 | 0.047 |  |  |
| 0.228 | 0.98 | 0.044 |  |  |
| 0.158 | 0.99 | 0.038 |  |  |
| 0.088 | 1.00 | 0.038 |  |  |
| 0.000 | 1.00 | 0.039 |  |  |
| TABLE C-3. Liquid data 1 mm, *Re* = 195,453, 0.6% V/V, uc =3.08 m s-1 | | | | |
|  |  |  |  |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *r/R* | *u/uc* | *u'/uc* | *r/R* | *v'/uc* | *r/R* | *w'/uc* |
| 0.954 | 0.61 | 0.076 | 0.000 | 0.022 | 0.928 | 0.041 |
| 0.945 | 0.62 | 0.075 | 0.052 | 0.022 | 0.919 | 0.043 |
| 0.936 | 0.64 | 0.075 | 0.103 | 0.023 | 0.901 | 0.038 |
| 0.928 | 0.66 | 0.078 | 0.155 | 0.023 | 0.884 | 0.040 |
| 0.919 | 0.67 | 0.079 | 0.207 | 0.023 | 0.813 | 0.037 |
| 0.901 | 0.70 | 0.070 | 0.258 | 0.025 | 0.742 | 0.034 |
| 0.884 | 0.72 | 0.074 | 0.310 | 0.026 | 0.671 | 0.036 |
| 0.813 | 0.77 | 0.067 | 0.362 | 0.025 | 0.600 | 0.034 |
| 0.742 | 0.80 | 0.066 | 0.465 | 0.027 | 0.529 | 0.031 |
| 0.671 | 0.82 | 0.064 | 0.491 | 0.028 | 0.458 | 0.030 |
| 0.600 | 0.85 | 0.056 | 0.569 | 0.028 | 0.386 | 0.029 |
| 0.529 | 0.86 | 0.053 | 0.672 | 0.031 | 0.315 | 0.028 |
| 0.458 | 0.88 | 0.050 | 0.775 | 0.032 | 0.173 | 0.025 |
| 0.386 | 0.90 | 0.052 | 0.879 | 0.031 | 0.031 | 0.024 |
| 0.315 | 0.91 | 0.045 |  |  | -0.004 | 0.021 |
| 0.173 | 0.94 | 0.039 |  |  |  |  |
| 0.031 | 0.95 | 0.033 |  |  |  |  |
| -0.004 | 0.96 | 0.035 |  |  |  |  |
| TABLE C-4. Solid data 1 mm, *Re* = 195,453, 0.6% V/V, uc =3.08 m s-1 | | | | | | |

|  |  |  |
| --- | --- | --- |
| r/R | u/uc | u'/uc |
| 0.965 | 0.62 | 0.087 |
| 0.956 | 0.67 | 0.086 |
| 0.948 | 0.65 | 0.085 |
| 0.930 | 0.70 | 0.087 |
| 0.913 | 0.75 | 0.082 |
| 0.843 | 0.81 | 0.075 |
| 0.773 | 0.85 | 0.072 |
| 0.704 | 0.88 | 0.070 |
| 0.634 | 0.90 | 0.066 |
| 0.564 | 0.92 | 0.064 |
| 0.494 | 0.94 | 0.059 |
| 0.424 | 0.96 | 0.055 |
| 0.354 | 0.97 | 0.052 |
| 0.285 | 0.98 | 0.046 |
| 0.215 | 0.99 | 0.045 |
| 0.145 | 1.00 | 0.043 |
| 0.075 | 1.00 | 0.045 |
| -0.003 | 1.00 | 0.042 |
| TABLE C-5. Liquid data 1 mm, *Re* = 188,589, 1.3% V/V, uc =2.97 m s-1 | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| *r/R* | *u/uc* | *u'/uc* | *r/R* | *w'/uc* |
| 0.954 | 0.61 | 0.085 | 0.954 | 0.040 |
| 0.945 | 0.63 | 0.080 | 0.945 | 0.042 |
| 0.936 | 0.65 | 0.078 | 0.936 | 0.043 |
| 0.919 | 0.69 | 0.079 | 0.919 | 0.041 |
| 0.901 | 0.72 | 0.079 | 0.901 | 0.045 |
| 0.830 | 0.79 | 0.074 | 0.830 | 0.037 |
| 0.759 | 0.83 | 0.071 | 0.759 | 0.038 |
| 0.688 | 0.86 | 0.063 | 0.688 | 0.037 |
| 0.617 | 0.88 | 0.063 | 0.617 | 0.033 |
| 0.546 | 0.90 | 0.060 | 0.546 | 0.035 |
| 0.475 | 0.92 | 0.055 | 0.475 | 0.035 |
| 0.404 | 0.94 | 0.053 | 0.404 | 0.032 |
| 0.333 | 0.96 | 0.047 | 0.333 | 0.030 |
| 0.262 | 0.97 | 0.043 | 0.262 | 0.029 |
| 0.191 | 0.98 | 0.042 | 0.191 | 0.027 |
| 0.120 | 0.99 | 0.035 | 0.120 | 0.029 |
| 0.049 | 1.00 | 0.034 | 0.049 | 0.026 |
| -0.019 | 1.00 | 0.038 | -0.019 | 0.025 |
| TABLE C-6. Solid data 1 mm, *Re* = 188,589, 1.3% V/V, uc =2.97 m s-1 | | | | |

**2 mm particles**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *r/R* | *u/uc* | *u'/uc* | *r/R* | *v'/uc* | *r/R* | *w'/uc* |
| 0.985 | 0.50 | 0.126 | 0.982 | 0.038 | 0.953 | 0.055 |
| 0.981 | 0.52 | 0.113 | 0.956 | 0.039 | 0.950 | 0.056 |
| 0.978 | 0.58 | 0.089 | 0.931 | 0.037 | 0.941 | 0.055 |
| 0.974 | 0.55 | 0.098 | 0.905 | 0.037 | 0.933 | 0.054 |
| 0.971 | 0.55 | 0.095 | 0.879 | 0.038 | 0.915 | 0.053 |
| 0.967 | 0.60 | 0.090 | 0.853 | 0.038 | 0.898 | 0.052 |
| 0.964 | 0.56 | 0.103 | 0.827 | 0.038 | 0.828 | 0.048 |
| 0.960 | 0.60 | 0.085 | 0.801 | 0.036 | 0.758 | 0.042 |
| 0.957 | 0.61 | 0.083 | 0.775 | 0.036 | 0.688 | 0.040 |
| 0.953 | 0.64 | 0.084 | 0.672 | 0.037 | 0.619 | 0.038 |
| 0.950 | 0.64 | 0.085 | 0.568 | 0.032 | 0.549 | 0.037 |
| 0.941 | 0.66 | 0.083 | 0.465 | 0.028 | 0.479 | 0.035 |
| 0.933 | 0.69 | 0.084 | 0.362 | 0.027 | 0.409 | 0.031 |
| 0.915 | 0.73 | 0.079 | 0.362 | 0.027 | 0.339 | 0.030 |
| 0.898 | 0.74 | 0.079 | 0.258 | 0.025 | 0.269 | 0.028 |
| 0.828 | 0.80 | 0.071 | 0.155 | 0.024 | 0.200 | 0.028 |
| 0.758 | 0.84 | 0.070 | 0.052 | 0.025 | 0.130 | 0.024 |
| 0.688 | 0.87 | 0.068 | 0.000 | 0.022 | 0.060 | 0.025 |
| 0.619 | 0.89 | 0.067 |  |  | -0.010 | 0.023 |
| 0.549 | 0.91 | 0.061 |  |  |  |  |
| 0.479 | 0.93 | 0.057 |  |  |  |  |
| 0.409 | 0.95 | 0.055 |  |  |  |  |
| 0.339 | 0.96 | 0.047 |  |  |  |  |
| 0.269 | 0.98 | 0.042 |  |  |  |  |
| 0.200 | 0.99 | 0.039 |  |  |  |  |
| 0.130 | 1.00 | 0.035 |  |  |  |  |
| 0.060 | 0.99 | 0.037 |  |  |  |  |
| -0.010 | 1.00 | 0.035 |  |  |  |  |
| TABLE C-7. Liquid data 2 mm, *Re* = 192,056, 0.6% V/V, uc =3.03 m s-1 | | | | | | |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *r/R* | *u/uc* | *u'/uc* | *r/R* | *v'/uc* | *r/R* | *w'/uc* |
| 0.967 | 0.63 | 0.069 | 0.943 | 0.026 | 0.967 | 0.028 |
| 0.958 | 0.65 | 0.069 | 0.905 | 0.027 | 0.958 | 0.036 |
| 0.950 | 0.66 | 0.072 | 0.801 | 0.026 | 0.950 | 0.033 |
| 0.932 | 0.68 | 0.065 | 0.775 | 0.027 | 0.932 | 0.033 |
| 0.915 | 0.69 | 0.065 | 0.672 | 0.027 | 0.915 | 0.037 |
| 0.898 | 0.69 | 0.064 | 0.568 | 0.026 | 0.898 | 0.033 |
| 0.828 | 0.73 | 0.063 | 0.465 | 0.023 | 0.828 | 0.030 |
| 0.758 | 0.75 | 0.062 | 0.362 | 0.022 | 0.758 | 0.029 |
| 0.688 | 0.78 | 0.058 | 0.258 | 0.022 | 0.688 | 0.028 |
| 0.619 | 0.79 | 0.057 | 0.155 | 0.022 | 0.619 | 0.028 |
| 0.549 | 0.81 | 0.053 | 0.052 | 0.022 | 0.549 | 0.027 |
| 0.479 | 0.83 | 0.049 | 0.000 | 0.021 | 0.479 | 0.025 |
| 0.409 | 0.84 | 0.049 |  |  | 0.409 | 0.025 |
| 0.340 | 0.86 | 0.042 |  |  | 0.340 | 0.023 |
| 0.270 | 0.87 | 0.042 |  |  | 0.270 | 0.025 |
| 0.200 | 0.88 | 0.036 |  |  | 0.200 | 0.023 |
| 0.130 | 0.89 | 0.036 |  |  | 0.130 | 0.023 |
| 0.061 | 0.90 | 0.030 |  |  | 0.061 | 0.021 |
| -0.009 | 0.90 | 0.031 |  |  | -0.009 | 0.021 |
| TABLE C-8. Solid data 2 mm, *Re* = 192,056, 0.6% V/V, uc =3.03 m s-1 | | | | | | |

|  |  |  |
| --- | --- | --- |
| *r/R* | *u/uc* | *u'/uc* |
| 0.976 | 0.61 | 0.091 |
| 0.968 | 0.67 | 0.083 |
| 0.959 | 0.68 | 0.080 |
| 0.951 | 0.69 | 0.082 |
| 0.942 | 0.71 | 0.078 |
| 0.925 | 0.74 | 0.072 |
| 0.907 | 0.76 | 0.077 |
| 0.837 | 0.81 | 0.072 |
| 0.768 | 0.85 | 0.073 |
| 0.698 | 0.89 | 0.072 |
| 0.628 | 0.91 | 0.071 |
| 0.558 | 0.93 | 0.071 |
| 0.488 | 0.94 | 0.065 |
| 0.419 | 0.95 | 0.070 |
| 0.349 | 0.96 | 0.064 |
| 0.279 | 0.99 | 0.058 |
| 0.209 | 0.99 | 0.059 |
| 0.139 | 1.00 | 0.057 |
| 0.069 | 1.00 | 0.057 |
| 0.000 | 0.99 | 0.060 |
| TABLE C-9. Liquid data 2mm, *Re* = 184,582, 1.37% V/V, uc =2.91 m s-1 | | |

|  |  |  |
| --- | --- | --- |
| *r/R* | *u/uc* | *u'/uc* |
| 0.931 | 0.67 | 0.067 |
| 0.922 | 0.69 | 0.067 |
| 0.913 | 0.69 | 0.064 |
| 0.904 | 0.70 | 0.065 |
| 0.887 | 0.72 | 0.063 |
| 0.869 | 0.73 | 0.066 |
| 0.798 | 0.76 | 0.063 |
| 0.656 | 0.81 | 0.059 |
| 0.585 | 0.83 | 0.059 |
| 0.514 | 0.84 | 0.052 |
| 0.443 | 0.87 | 0.051 |
| 0.372 | 0.88 | 0.047 |
| 0.301 | 0.89 | 0.046 |
| 0.230 | 0.90 | 0.044 |
| 0.159 | 0.92 | 0.039 |
| 0.088 | 0.92 | 0.036 |
| 0.017 | 0.93 | 0.033 |
| -0.009 | 0.93 | 0.035 |
| TABLE C-10. Solid data 2mm, *Re* = 184,582, 1.37% V/V, uc =2.91 m s-1 | | |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *r/R* | *u/uc* | *u'/uc* | *r/R* | *v'/uc* | *r/R* | *w'/uc* |
| 0.982 | 0.47 | 0.128 | 0.982 | 0.036 | 0.949 | 0.057 |
| 0.978 | 0.46 | 0.128 | 0.956 | 0.037 | 0.941 | 0.056 |
| 0.975 | 0.49 | 0.115 | 0.931 | 0.036 | 0.933 | 0.052 |
| 0.971 | 0.48 | 0.122 | 0.905 | 0.037 | 0.916 | 0.054 |
| 0.968 | 0.52 | 0.103 | 0.879 | 0.038 | 0.899 | 0.052 |
| 0.965 | 0.59 | 0.087 | 0.853 | 0.039 | 0.830 | 0.047 |
| 0.961 | 0.59 | 0.081 | 0.827 | 0.036 | 0.762 | 0.045 |
| 0.958 | 0.55 | 0.100 | 0.801 | 0.036 | 0.693 | 0.041 |
| 0.949 | 0.56 | 0.085 | 0.775 | 0.037 | 0.693 | 0.043 |
| 0.941 | 0.57 | 0.085 | 0.672 | 0.034 | 0.625 | 0.041 |
| 0.933 | 0.62 | 0.086 | 0.568 | 0.033 | 0.556 | 0.041 |
| 0.916 | 0.67 | 0.082 | 0.465 | 0.030 | 0.488 | 0.037 |
| 0.899 | 0.70 | 0.082 | 0.362 | 0.027 | 0.420 | 0.033 |
| 0.830 | 0.78 | 0.073 | 0.258 | 0.025 | 0.351 | 0.031 |
| 0.762 | 0.83 | 0.069 | 0.155 | 0.024 | 0.283 | 0.030 |
| 0.693 | 0.86 | 0.066 | 0.052 | 0.024 | 0.283 | 0.029 |
| 0.693 | 0.86 | 0.066 | 0.000 | 0.024 | 0.214 | 0.027 |
| 0.625 | 0.89 | 0.063 |  |  | 0.146 | 0.026 |
| 0.556 | 0.91 | 0.059 |  |  | 0.077 | 0.024 |
| 0.488 | 0.93 | 0.054 |  |  | 0.009 | 0.023 |
| 0.420 | 0.95 | 0.048 |  |  | 0.076 | 0.022 |
| 0.351 | 0.96 | 0.044 |  |  |  |  |
| 0.283 | 0.97 | 0.042 |  |  |  |  |
| 0.283 | 0.98 | 0.041 |  |  |  |  |
| 0.214 | 0.98 | 0.040 |  |  |  |  |
| 0.146 | 0.99 | 0.034 |  |  |  |  |
| 0.077 | 1.00 | 0.035 |  |  |  |  |
| 0.009 | 1.00 | 0.031 |  |  |  |  |
| 0.076 | 1.00 | 0.032 |  |  |  |  |
| TABLE C-11. Liquid data 2mm, *Re* = 346,026, 0.7% V/V, uc =5.45 m s1 | | | | | | |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *r/R* | *u/uc* | *u'/uc* | *r/R* | *v'/uc* | *r/R* | *w'/uc* |
| 0.987 | 0.71 | 0.073 | 0.879 | 0.026 | 0.952 | 0.030 |
| 0.969 | 0.73 | 0.070 | 0.827 | 0.026 | 0.882 | 0.031 |
| 0.952 | 0.73 | 0.066 | 0.775 | 0.025 | 0.743 | 0.027 |
| 0.882 | 0.79 | 0.064 | 0.672 | 0.023 | 0.673 | 0.027 |
| 0.743 | 0.84 | 0.058 | 0.568 | 0.022 | 0.534 | 0.024 |
| 0.673 | 0.86 | 0.056 | 0.465 | 0.022 | 0.464 | 0.022 |
| 0.534 | 0.90 | 0.048 | 0.362 | 0.021 | 0.394 | 0.022 |
| 0.464 | 0.91 | 0.043 | 0.258 | 0.020 | 0.255 | 0.021 |
| 0.394 | 0.92 | 0.038 | 0.155 | 0.020 | 0.115 | 0.019 |
| 0.255 | 0.94 | 0.033 | 0.052 | 0.020 | -0.024 | 0.019 |
| 0.115 | 0.96 | 0.029 | 0.000 | 0.018 |  |  |
| -0.024 | 0.96 | 0.028 |  |  |  |  |
| TABLE C-12. Solid data 2 mm, *Re* = 346,026, 0.7% V/V, uc =5.45 m s-1 | | | | | | |

**3 mm particles**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *r/R* | *u/uc* | *u'/uc* | *r/R* | *v'/uc* | *r/R* | *w'/uc* |
| 0.987 | 0.54 | 0.099 | 0.943 | 0.036 | 0.987 | 0.057 |
| 0.978 | 0.60 | 0.086 | 0.931 | 0.037 | 0.978 | 0.061 |
| 0.970 | 0.62 | 0.085 | 0.905 | 0.038 | 0.970 | 0.058 |
| 0.952 | 0.65 | 0.082 | 0.879 | 0.036 | 0.952 | 0.054 |
| 0.935 | 0.69 | 0.079 | 0.853 | 0.036 | 0.935 | 0.051 |
| 0.865 | 0.77 | 0.077 | 0.827 | 0.037 | 0.865 | 0.047 |
| 0.795 | 0.82 | 0.073 | 0.801 | 0.038 | 0.795 | 0.044 |
| 0.725 | 0.84 | 0.073 | 0.775 | 0.035 | 0.725 | 0.040 |
| 0.656 | 0.87 | 0.070 | 0.672 | 0.035 | 0.656 | 0.039 |
| 0.586 | 0.90 | 0.067 | 0.568 | 0.032 | 0.586 | 0.039 |
| 0.516 | 0.92 | 0.064 | 0.465 | 0.031 | 0.516 | 0.036 |
| 0.446 | 0.93 | 0.060 | 0.362 | 0.029 | 0.446 | 0.034 |
| 0.376 | 0.95 | 0.056 | 0.258 | 0.026 | 0.376 | 0.032 |
| 0.307 | 0.97 | 0.052 | 0.155 | 0.025 | 0.307 | 0.029 |
| 0.237 | 0.98 | 0.045 | 0.052 | 0.025 | 0.237 | 0.027 |
| 0.167 | 0.99 | 0.046 | 0.000 | 0.025 | 0.167 | 0.026 |
| 0.097 | 0.99 | 0.039 |  |  | 0.097 | 0.024 |
| 0.027 | 1.00 | 0.039 |  |  | 0.027 | 0.025 |
| -0.007 | 1.00 | 0.039 |  |  | -0.007 | 0.027 |
| TABLE C-13. Liquid data 3mm, *Re* = 196,336, 0.66% V/V, uc =3.09 m s-1 | | | | | | |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *r/R* | *u/uc* | *u'/uc* | *r/R* | *v'/uc* | *r/R* | *w'/uc* |
| 0.930 | 0.67 | 0.061 | 0.956 | 0.023 | 0.904 | 0.030 |
| 0.922 | 0.68 | 0.058 | 0.905 | 0.024 | 0.887 | 0.030 |
| 0.913 | 0.68 | 0.055 | 0.879 | 0.025 | 0.816 | 0.029 |
| 0.904 | 0.69 | 0.055 | 0.827 | 0.025 | 0.745 | 0.029 |
| 0.887 | 0.69 | 0.055 | 0.801 | 0.024 | 0.674 | 0.027 |
| 0.816 | 0.71 | 0.053 | 0.775 | 0.024 | 0.603 | 0.027 |
| 0.745 | 0.73 | 0.056 | 0.672 | 0.024 | 0.532 | 0.026 |
| 0.674 | 0.75 | 0.057 | 0.568 | 0.024 | 0.461 | 0.024 |
| 0.603 | 0.77 | 0.057 | 0.465 | 0.024 | 0.390 | 0.024 |
| 0.532 | 0.78 | 0.059 | 0.362 | 0.022 | 0.319 | 0.025 |
| 0.461 | 0.80 | 0.052 | 0.258 | 0.022 | 0.247 | 0.023 |
| 0.390 | 0.82 | 0.049 | 0.155 | 0.021 | 0.176 | 0.022 |
| 0.319 | 0.84 | 0.046 | 0.052 | 0.021 | 0.105 | 0.020 |
| 0.247 | 0.85 | 0.051 | 0.000 | 0.022 | 0.034 | 0.022 |
| 0.176 | 0.86 | 0.041 |  |  | -0.037 | 0.022 |
| 0.105 | 0.87 | 0.039 |  |  |  |  |
| 0.034 | 0.88 | 0.035 |  |  |  |  |
| -0.037 | 0.89 | 0.033 |  |  |  |  |
| TABLE C-14. Solid data 3mm, *Re* = 196,336, 0.66% V/V, uc =3.09 m s-1 | | | | | | |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *r/R* | *u/uc* | *u'/uc* | *r/R* | *v'/uc* | *r/R* | *w'/uc* |
| 0.982 | 0.61 | 0.083 | 0.956 | 0.039 | 0.982 | 0.057 |
| 0.956 | 0.68 | 0.081 | 0.931 | 0.035 | 0.956 | 0.052 |
| 0.938 | 0.71 | 0.080 | 0.905 | 0.036 | 0.938 | 0.051 |
| 0.868 | 0.78 | 0.073 | 0.879 | 0.038 | 0.868 | 0.047 |
| 0.799 | 0.82 | 0.074 | 0.853 | 0.034 | 0.799 | 0.038 |
| 0.729 | 0.85 | 0.074 | 0.827 | 0.034 | 0.729 | 0.040 |
| 0.659 | 0.88 | 0.077 | 0.801 | 0.035 | 0.659 | 0.036 |
| 0.589 | 0.90 | 0.072 | 0.775 | 0.034 | 0.589 | 0.034 |
| 0.519 | 0.92 | 0.065 | 0.672 | 0.033 | 0.519 | 0.034 |
| 0.450 | 0.94 | 0.066 | 0.568 | 0.030 | 0.450 | 0.034 |
| 0.380 | 0.96 | 0.059 | 0.465 | 0.031 | 0.380 | 0.031 |
| 0.310 | 0.97 | 0.057 | 0.362 | 0.028 | 0.310 | 0.028 |
| 0.240 | 0.99 | 0.054 | 0.258 | 0.027 | 0.240 | 0.027 |
| 0.170 | 0.99 | 0.049 | 0.155 | 0.025 | 0.170 | 0.026 |
| 0.100 | 1.00 | 0.046 | 0.052 | 0.025 | 0.100 | 0.025 |
| 0.031 | 1.00 | 0.048 | 0.000 | 0.024 | 0.031 | 0.024 |
| 0.005 | 1.00 | 0.051 |  |  | 0.005 | 0.025 |
| TABLE C-15. Liquid data 3mm, *Re* = 193,542, 1.22% V/V, uc =3.05 m s-1 | | | | | | |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *r/R* | *u/uc* | *u'/uc* | *r/R* | *v'/uc* | *r/R* | *w'/uc* |
| 0.052 | 0.88 | 0.038 | 0.879 | 0.022 | 0.803 | 0.027 |
| 0.155 | 0.87 | 0.038 | 0.827 | 0.024 | 0.732 | 0.027 |
| 0.258 | 0.86 | 0.044 | 0.801 | 0.024 | 0.661 | 0.027 |
| 0.362 | 0.85 | 0.047 | 0.672 | 0.023 | 0.590 | 0.027 |
| 0.465 | 0.83 | 0.052 | 0.568 | 0.023 | 0.519 | 0.025 |
| 0.568 | 0.81 | 0.057 | 0.465 | 0.022 | 0.448 | 0.026 |
| 0.672 | 0.78 | 0.059 | 0.362 | 0.022 | 0.377 | 0.023 |
| 0.775 | 0.75 | 0.063 | 0.258 | 0.022 | 0.306 | 0.023 |
| 0.801 | 0.73 | 0.056 | 0.155 | 0.021 | 0.235 | 0.024 |
| 0.827 | 0.71 | 0.057 | 0.052 | 0.020 | 0.164 | 0.022 |
| 0.879 | 0.70 | 0.056 | 0.000 | 0.021 | 0.093 | 0.021 |
|  |  |  |  |  | 0.004 | 0.022 |
| TABLE C-16. Solid data 3mm, *Re* = 193,542, 1.22% V/V, uc =3.05 m s-1 | | | | | | |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *r/R* | *u/uc* | *u'/uc* | *r/R* | *v'/uc* | *r/R* | *w'/uc* |
| 0.987 | 0.61 | 0.086 | 0.956 | 0.037 | 0.987 | 0.057 |
| 0.979 | 0.63 | 0.083 | 0.931 | 0.036 | 0.979 | 0.057 |
| 0.970 | 0.65 | 0.083 | 0.905 | 0.037 | 0.970 | 0.052 |
| 0.962 | 0.69 | 0.085 | 0.879 | 0.034 | 0.962 | 0.051 |
| 0.953 | 0.70 | 0.080 | 0.853 | 0.035 | 0.953 | 0.052 |
| 0.936 | 0.73 | 0.077 | 0.827 | 0.038 | 0.936 | 0.050 |
| 0.918 | 0.76 | 0.074 | 0.801 | 0.037 | 0.918 | 0.046 |
| 0.849 | 0.81 | 0.071 | 0.775 | 0.035 | 0.849 | 0.043 |
| 0.779 | 0.85 | 0.071 | 0.672 | 0.033 | 0.779 | 0.041 |
| 0.709 | 0.87 | 0.064 | 0.568 | 0.034 | 0.709 | 0.040 |
| 0.639 | 0.90 | 0.058 | 0.465 | 0.029 | 0.639 | 0.039 |
| 0.569 | 0.92 | 0.054 | 0.362 | 0.026 | 0.569 | 0.037 |
| 0.499 | 0.94 | 0.049 | 0.258 | 0.025 | 0.499 | 0.033 |
| 0.430 | 0.95 | 0.047 | 0.155 | 0.024 | 0.430 | 0.031 |
| 0.360 | 0.97 | 0.043 | 0.052 | 0.022 | 0.360 | 0.028 |
| 0.290 | 0.98 | 0.040 | 0.000 | 0.022 | 0.290 | 0.026 |
| 0.220 | 0.99 | 0.039 |  |  | 0.220 | 0.027 |
| 0.150 | 0.99 | 0.033 |  |  | 0.150 | 0.024 |
| 0.080 | 1.00 | 0.034 |  |  | 0.080 | 0.023 |
| 0.011 | 1.00 | 0.033 |  |  | 0.011 | 0.023 |
| -0.007 | 1.00 | 0.032 |  |  | -0.007 | 0.021 |
| TABLE C-17. Liquid data 3mm, *Re* = 338,127, 0.62% V/V, uc =5.09 m s-1 | | | | | | |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *r/R* | *u/uc* | *u'/uc* | *r/R* | *v'/uc* | *r/R* | *w'/uc* |
| 0.960 | 0.30 | 0.291 | 0.956 | 0.026 | 0.899 | 0.036 |
| 0.952 | 0.37 | 0.300 | 0.931 | 0.027 | 0.882 | 0.031 |
| 0.943 | 0.71 | 0.060 | 0.905 | 0.025 | 0.864 | 0.031 |
| 0.925 | 0.72 | 0.069 | 0.879 | 0.027 | 0.793 | 0.032 |
| 0.917 | 0.73 | 0.062 | 0.827 | 0.025 | 0.722 | 0.029 |
| 0.908 | 0.73 | 0.066 | 0.801 | 0.026 | 0.651 | 0.027 |
| 0.899 | 0.74 | 0.066 | 0.775 | 0.025 | 0.580 | 0.026 |
| 0.882 | 0.76 | 0.066 | 0.672 | 0.025 | 0.509 | 0.024 |
| 0.864 | 0.76 | 0.064 | 0.568 | 0.023 | 0.438 | 0.025 |
| 0.793 | 0.79 | 0.060 | 0.465 | 0.023 | 0.367 | 0.022 |
| 0.722 | 0.82 | 0.053 | 0.362 | 0.020 | 0.296 | 0.023 |
| 0.651 | 0.84 | 0.050 | 0.258 | 0.019 | 0.225 | 0.021 |
| 0.580 | 0.85 | 0.048 | 0.155 | 0.019 | 0.154 | 0.020 |
| 0.509 | 0.87 | 0.049 | 0.052 | 0.019 | 0.083 | 0.019 |
| 0.438 | 0.88 | 0.042 | 0.000 | 0.018 | 0.012 | 0.019 |
| 0.367 | 0.90 | 0.044 |  |  | -0.024 | 0.019 |
| 0.296 | 0.91 | 0.039 |  |  |  |  |
| 0.225 | 0.93 | 0.037 |  |  |  |  |
| 0.154 | 0.93 | 0.033 |  |  |  |  |
| 0.083 | 0.94 | 0.031 |  |  |  |  |
| 0.012 | 0.95 | 0.032 |  |  |  |  |
| -0.024 | 0.95 | 0.029 |  |  |  |  |
| TABLE C-18. Solid data 3mm, *Re* = 338,127, 0.62% V/V, uc =5.09 m s-1 | | | | | | |

**4 mm particles**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *r/R* | *u/uc* | *u'/uc* | *r/R* | *v'/uc* | *r/R* | *w'/uc* |
| 0.982 | 0.58 | 0.087 | 0.943 | 0.038 | 0.982 | 0.056 |
| 0.973 | 0.61 | 0.080 | 0.931 | 0.039 | 0.973 | 0.056 |
| 0.956 | 0.64 | 0.080 | 0.905 | 0.038 | 0.956 | 0.053 |
| 0.886 | 0.76 | 0.075 | 0.879 | 0.038 | 0.886 | 0.048 |
| 0.816 | 0.80 | 0.076 | 0.827 | 0.036 | 0.816 | 0.043 |
| 0.746 | 0.83 | 0.075 | 0.801 | 0.037 | 0.746 | 0.041 |
| 0.677 | 0.86 | 0.074 | 0.775 | 0.035 | 0.677 | 0.041 |
| 0.607 | 0.89 | 0.070 | 0.672 | 0.036 | 0.607 | 0.040 |
| 0.537 | 0.91 | 0.063 | 0.568 | 0.035 | 0.537 | 0.040 |
| 0.467 | 0.93 | 0.062 | 0.465 | 0.030 | 0.467 | 0.035 |
| 0.397 | 0.95 | 0.062 | 0.362 | 0.031 | 0.397 | 0.032 |
| 0.328 | 0.96 | 0.053 | 0.258 | 0.029 | 0.328 | 0.031 |
| 0.258 | 0.98 | 0.049 | 0.155 | 0.028 | 0.258 | 0.029 |
| 0.188 | 0.99 | 0.045 | 0.052 | 0.025 | 0.188 | 0.028 |
| 0.118 | 0.99 | 0.042 | 0.000 | 0.026 | 0.118 | 0.029 |
| 0.048 | 1.00 | 0.036 |  |  | 0.048 | 0.025 |
| 0.002 | 1.00 | 0.040 |  |  | 0.002 | 0.026 |
| TABLE C-19. Liquid data 4mm, *Re* = 197,669, 0.69% V/V, uc =3.11 m s-1 | | | | | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| *r/R* | *u/uc* | *u'/uc* | *r/R* | *w'/uc* |
| 0.935 | 0.65 | 0.059 | 0.812 | 0.027 |
| 0.927 | 0.66 | 0.053 | 0.741 | 0.026 |
| 0.918 | 0.66 | 0.052 | 0.670 | 0.025 |
| 0.900 | 0.68 | 0.055 | 0.599 | 0.028 |
| 0.883 | 0.67 | 0.056 | 0.527 | 0.025 |
| 0.812 | 0.69 | 0.054 | 0.385 | 0.023 |
| 0.741 | 0.70 | 0.056 |  |  |
| 0.670 | 0.71 | 0.057 |  |  |
| 0.599 | 0.73 | 0.060 |  |  |
| 0.527 | 0.74 | 0.057 |  |  |
| 0.385 | 0.78 | 0.056 |  |  |
| 0.243 | 0.81 | 0.050 |  |  |
| 0.101 | 0.84 | 0.045 |  |  |
| 0.012 | 0.85 | 0.041 |  |  |
| TABLE C-20. Solid data 4mm, *Re* = 197,669, 0.69% V/V, uc =3.11 m s-1 | | | | |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *r/R* | *u/uc* | *u'/uc* | *r/R* | *v'/uc* | *r/R* | *w'/uc* |
| 0.951 | 0.67 | 0.077 | 0.943 | 0.039 | 0.943 | 0.041 |
| 0.943 | 0.69 | 0.077 | 0.931 | 0.036 | 0.934 | 0.050 |
| 0.934 | 0.70 | 0.079 | 0.905 | 0.036 | 0.917 | 0.046 |
| 0.917 | 0.72 | 0.079 | 0.879 | 0.036 | 0.830 | 0.046 |
| 0.830 | 0.79 | 0.079 | 0.853 | 0.037 | 0.690 | 0.040 |
| 0.690 | 0.85 | 0.077 | 0.827 | 0.037 | 0.550 | 0.037 |
| 0.550 | 0.91 | 0.074 | 0.801 | 0.036 | 0.411 | 0.032 |
| 0.411 | 0.95 | 0.066 | 0.775 | 0.034 | 0.341 | 0.031 |
| 0.341 | 0.97 | 0.061 | 0.672 | 0.035 | 0.271 | 0.030 |
| 0.271 | 0.99 | 0.055 | 0.568 | 0.033 | 0.201 | 0.028 |
| 0.201 | 0.99 | 0.052 | 0.465 | 0.030 | 0.131 | 0.027 |
| 0.131 | 1.00 | 0.050 | 0.362 | 0.027 | 0.062 | 0.028 |
| 0.062 | 1.00 | 0.047 | 0.258 | 0.027 | 0.009 | 0.027 |
| 0.009 | 1.00 | 0.048 | 0.155 | 0.027 |  |  |
|  |  |  | 0.052 | 0.028 |  |  |
|  |  |  | 0.000 | 0.027 |  |  |
| TABLE F21. Liquid data 4mm, *Re* = 195,542, 1.23% V/V, uc =3.08 m s1 | | | | | | |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *r/R* | *u/uc* | *u'/uc* | *r/R* | *v'/uc* | *r/R* | *w'/uc* |
| 0.939 | 0.66 | 0.060 | 0.931 | 0.021 | 0.869 | 0.031 |  |
| 0.930 | 0.66 | 0.058 | 0.905 | 0.022 | 0.851 | 0.026 |  |
| 0.922 | 0.67 | 0.057 | 0.879 | 0.023 | 0.780 | 0.027 |  |
| 0.913 | 0.67 | 0.055 | 0.853 | 0.025 | 0.709 | 0.027 |  |
| 0.904 | 0.67 | 0.056 | 0.775 | 0.023 | 0.638 | 0.027 |  |
| 0.887 | 0.67 | 0.058 | 0.672 | 0.025 | 0.567 | 0.024 |  |
| 0.869 | 0.68 | 0.061 | 0.568 | 0.024 | 0.496 | 0.027 |  |
| 0.851 | 0.69 | 0.058 | 0.465 | 0.024 | 0.425 | 0.027 |  |
| 0.780 | 0.69 | 0.063 | 0.362 | 0.024 | 0.354 | 0.026 |  |
| 0.709 | 0.70 | 0.062 | 0.258 | 0.024 | 0.283 | 0.026 |  |
| 0.638 | 0.72 | 0.064 | 0.155 | 0.024 | 0.212 | 0.024 |  |
| 0.567 | 0.74 | 0.064 | 0.052 | 0.023 | 0.141 | 0.024 |  |
| 0.496 | 0.76 | 0.064 | 0.000 | 0.025 | -0.001 | 0.024 |  |
| 0.425 | 0.78 | 0.058 |  |  |  |  |  |
| 0.354 | 0.81 | 0.053 |  |  |  |  |  |
| 0.283 | 0.81 | 0.059 |  |  |  |  |  |
| 0.212 | 0.83 | 0.054 |  |  |  |  |  |
| 0.141 | 0.84 | 0.045 |  |  |  |  |  |
| -0.001 | 0.86 | 0.043 |  |  |  |  |  |
| TABLE C-22. Solid data 4mm, *Re* = 195,542, 1.23% V/V, uc =3.08 m s-1 | | | | | | | |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *r/R* | *u/uc* | *u'/uc* | *r/R* | *v'/uc* | *r/R* | *w'/uc* |
| 0.953 | 0.66 | 0.080 | 0.956 | 0.036 | 0.953 | 0.055 |
| 0.936 | 0.69 | 0.080 | 0.931 | 0.038 | 0.936 | 0.052 |
| 0.919 | 0.72 | 0.076 | 0.905 | 0.036 | 0.919 | 0.049 |
| 0.849 | 0.77 | 0.078 | 0.879 | 0.035 | 0.849 | 0.044 |
| 0.779 | 0.78 | 0.090 | 0.853 | 0.035 | 0.709 | 0.038 |
| 0.709 | 0.83 | 0.089 | 0.827 | 0.035 | 0.569 | 0.036 |
| 0.639 | 0.83 | 0.093 | 0.801 | 0.037 | 0.500 | 0.035 |
| 0.569 | 0.89 | 0.084 | 0.775 | 0.034 | 0.430 | 0.036 |
| 0.500 | 0.91 | 0.081 | 0.672 | 0.033 | 0.360 | 0.031 |
| 0.430 | 0.94 | 0.081 | 0.568 | 0.034 | 0.290 | 0.031 |
| 0.360 | 0.95 | 0.075 | 0.465 | 0.032 | 0.220 | 0.031 |
| 0.290 | 0.97 | 0.074 | 0.362 | 0.029 | 0.150 | 0.029 |
| 0.220 | 0.98 | 0.068 | 0.258 | 0.028 | 0.081 | 0.030 |
| 0.150 | 0.98 | 0.069 | 0.155 | 0.028 | 0.001 | 0.030 |
| 0.081 | 0.99 | 0.074 | 0.052 | 0.026 |  |  |
| 0.001 | 1.00 | 0.059 | 0.000 | 0.029 |  |  |
| TABLE C-23. Liquid data 4mm, *Re* = 184,366, 1.6% V/V, uc =2.90 m s-1 | | | | | | |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *r/R* | *u/uc* | *u'/uc* | *r/R* | *v'/uc* | *r/R* | *w'/uc* |
| 0.937 | 0.68 | 0.064 | 0.905 | 0.022 | 0.867 | 0.033 |
| 0.928 | 0.69 | 0.060 | 0.879 | 0.023 | 0.849 | 0.027 |
| 0.919 | 0.69 | 0.060 | 0.827 | 0.023 | 0.778 | 0.026 |
| 0.910 | 0.70 | 0.059 | 0.775 | 0.025 | 0.707 | 0.028 |
| 0.902 | 0.69 | 0.058 | 0.672 | 0.024 | 0.636 | 0.026 |
| 0.893 | 0.70 | 0.060 | 0.568 | 0.025 | 0.565 | 0.024 |
| 0.884 | 0.70 | 0.056 | 0.465 | 0.024 | 0.494 | 0.025 |
| 0.867 | 0.72 | 0.059 | 0.362 | 0.025 | 0.423 | 0.025 |
| 0.849 | 0.71 | 0.059 | 0.258 | 0.024 | 0.352 | 0.026 |
| 0.778 | 0.73 | 0.063 | 0.155 | 0.025 | 0.281 | 0.024 |
| 0.707 | 0.74 | 0.064 | 0.052 | 0.025 | 0.210 | 0.026 |
| 0.636 | 0.76 | 0.062 | 0.000 | 0.024 | 0.139 | 0.024 |
| 0.565 | 0.78 | 0.060 |  |  | 0.068 | 0.024 |
| 0.494 | 0.80 | 0.057 |  |  | -0.075 | 0.024 |
| 0.423 | 0.81 | 0.058 |  |  |  |  |
| 0.352 | 0.83 | 0.052 |  |  |  |  |
| 0.281 | 0.84 | 0.057 |  |  |  |  |
| 0.210 | 0.85 | 0.048 |  |  |  |  |
| 0.139 | 0.86 | 0.048 |  |  |  |  |
| 0.068 | 0.87 | 0.044 |  |  |  |  |
| -0.075 | 0.87 | 0.045 |  |  |  |  |
| TABLE C-24. Solid data 4mm, *Re* = 184,366, 1.6% V/V, uc =2.90 m s-1 | | | | | | |
| *r/R* | *u/uc* | *u'/uc* |
| 0.984 | 0.60 | 0.090 |
| 0.975 | 0.61 | 0.092 |
| 0.966 | 0.64 | 0.088 |
| 0.949 | 0.69 | 0.086 |
| 0.932 | 0.72 | 0.081 |
| 0.862 | 0.79 | 0.085 |
| 0.792 | 0.83 | 0.093 |
| 0.722 | 0.86 | 0.092 |
| 0.653 | 0.89 | 0.087 |
| 0.583 | 0.91 | 0.093 |
| 0.513 | 0.93 | 0.088 |
| 0.443 | 0.95 | 0.090 |
| 0.373 | 0.97 | 0.084 |
| 0.373 | 0.96 | 0.087 |
| 0.303 | 0.98 | 0.081 |
| 0.234 | 0.99 | 0.080 |
| 0.164 | 1.01 | 0.076 |
| 0.094 | 1.00 | 0.072 |
| 0.024 | 1.01 | 0.072 |
| 0.006 | 1.00 | 0.074 |
| TABLE C-25. Liquid data 4mm, *Re* = 174,334, 2.02% V/V, uc =2.75 m s-1 | | |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *r/R* | *u/uc* | *u'/uc* | *r/R* | *v'/uc* | *r/R* | *w'/uc* |
| 0.943 | 0.70 | 0.077 | 0.931 | 0.023 | 0.899 | 0.024 |
| 0.934 | 0.70 | 0.069 | 0.879 | 0.023 | 0.882 | 0.029 |
| 0.925 | 0.71 | 0.068 | 0.827 | 0.023 | 0.864 | 0.028 |
| 0.917 | 0.71 | 0.066 | 0.775 | 0.023 | 0.793 | 0.030 |
| 0.908 | 0.71 | 0.059 | 0.672 | 0.024 | 0.722 | 0.029 |
| 0.899 | 0.72 | 0.063 | 0.568 | 0.026 | 0.651 | 0.030 |
| 0.882 | 0.73 | 0.061 | 0.362 | 0.025 | 0.580 | 0.028 |
| 0.864 | 0.73 | 0.065 | 0.258 | 0.024 | 0.509 | 0.028 |
| 0.793 | 0.73 | 0.069 | 0.155 | 0.026 | 0.438 | 0.026 |
| 0.722 | 0.76 | 0.069 | 0.052 | 0.025 | 0.367 | 0.026 |
| 0.651 | 0.77 | 0.064 | 0.000 | 0.024 | 0.296 | 0.025 |
| 0.580 | 0.80 | 0.066 |  |  | 0.225 | 0.027 |
| 0.509 | 0.82 | 0.065 |  |  | 0.154 | 0.025 |
| 0.438 | 0.83 | 0.059 |  |  | 0.083 | 0.024 |
| 0.367 | 0.85 | 0.059 |  |  | -0.006 | 0.024 |
| 0.296 | 0.86 | 0.055 |  |  |  |  |
| 0.225 | 0.87 | 0.053 |  |  |  |  |
| 0.154 | 0.88 | 0.051 |  |  |  |  |
| 0.083 | 0.89 | 0.050 |  |  |  |  |
| -0.006 | 0.89 | 0.049 |  |  |  |  |
| TABLE C-26. Solid data 4mm, *Re* = 174,334, 2.02% V/V, uc =2.75 m s-1 | | | | | | |

|  |  |  |
| --- | --- | --- |
| *r/R* | *u/uc* | *u'/uc* |
| 0.976 | 0.61 | 0.081 |
| 0.959 | 0.67 | 0.079 |
| 0.941 | 0.70 | 0.071 |
| 0.924 | 0.74 | 0.071 |
| 0.907 | 0.75 | 0.073 |
| 0.837 | 0.82 | 0.067 |
| 0.767 | 0.85 | 0.071 |
| 0.697 | 0.88 | 0.068 |
| 0.627 | 0.90 | 0.068 |
| 0.558 | 0.93 | 0.067 |
| 0.488 | 0.95 | 0.069 |
| 0.418 | 0.96 | 0.066 |
| 0.348 | 0.98 | 0.063 |
| 0.278 | 0.99 | 0.060 |
| 0.209 | 0.99 | 0.061 |
| 0.139 | 1.00 | 0.059 |
| 0.069 | 0.99 | 0.066 |
| -0.001 | 1.00 | 0.060 |
| TABLE C-27. Liquid data 4mm, *Re* = 211,264,  2.02% V/V, uc =3.33 m s-1 | | |

|  |  |  |
| --- | --- | --- |
| *r/R* | *u/uc* | *u'/uc* |
| 0.933 | 0.68 | 0.062 |
| 0.916 | 0.71 | 0.065 |
| 0.899 | 0.71 | 0.076 |
| 0.881 | 0.73 | 0.065 |
| 0.812 | 0.75 | 0.053 |
| 0.742 | 0.77 | 0.053 |
| 0.673 | 0.79 | 0.053 |
| 0.603 | 0.81 | 0.049 |
| 0.533 | 0.82 | 0.051 |
| 0.464 | 0.84 | 0.045 |
| 0.394 | 0.85 | 0.044 |
| 0.325 | 0.86 | 0.043 |
| 0.255 | 0.86 | 0.040 |
| 0.185 | 0.88 | 0.039 |
| 0.116 | 0.88 | 0.039 |
| 0.012 | 0.89 | 0.041 |
| TABLE C-28. Solid data 4mm, *Re* = 211,264,  2.02% V/V, uc =3.33 m s-1 | | |

|  |  |  |
| --- | --- | --- |
| *r/R* | *u/uc* | *u'/uc* |
| 0.981 | 0.57 | 0.091 |
| 0.973 | 0.63 | 0.084 |
| 0.964 | 0.66 | 0.082 |
| 0.955 | 0.68 | 0.077 |
| 0.947 | 0.69 | 0.083 |
| 0.930 | 0.73 | 0.073 |
| 0.912 | 0.75 | 0.073 |
| 0.842 | 0.81 | 0.067 |
| 0.773 | 0.85 | 0.061 |
| 0.703 | 0.88 | 0.061 |
| 0.633 | 0.91 | 0.058 |
| 0.563 | 0.93 | 0.057 |
| 0.493 | 0.95 | 0.057 |
| 0.423 | 0.97 | 0.054 |
| 0.354 | 0.98 | 0.051 |
| 0.284 | 0.99 | 0.053 |
| 0.214 | 1.00 | 0.049 |
| 0.144 | 1.00 | 0.052 |
| 0.074 | 1.00 | 0.047 |
| 0.004 | 1.00 | 0.048 |
| TABLE C-29. Liquid data 4mm, *Re* = 251,338,  2.02% V/V, uc =3.96 m s-1 | | |

|  |  |  |
| --- | --- | --- |
| *r/R* | *u/uc* | *u'/uc* |
| 0.061 | 0.91 | 0.030 |
| 0.130 | 0.90 | 0.030 |
| 0.200 | 0.90 | 0.034 |
| 0.270 | 0.89 | 0.036 |
| 0.339 | 0.88 | 0.038 |
| 0.409 | 0.87 | 0.036 |
| 0.478 | 0.86 | 0.040 |
| 0.548 | 0.83 | 0.042 |
| 0.618 | 0.81 | 0.044 |
| 0.687 | 0.80 | 0.050 |
| 0.757 | 0.79 | 0.050 |
| 0.826 | 0.76 | 0.050 |
| 0.896 | 0.73 | 0.057 |
| 0.913 | 0.71 | 0.073 |
| 0.931 | 0.64 | 0.118 |
| 0.939 | 0.57 | 0.149 |
| TABLE C-30. Solid data 4mm, *Re* = 251,338, 2.02% V/V, uc =3.96 m s-1 | | |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *r/R* | *u/uc* | *u'/uc* | *r/R* | *v'/uc* | *r/R* | *w'/uc* |
| 0.988 | 0.59 | 0.084 | 0.943 | 0.038 | 0.988 | 0.055 |
| 0.979 | 0.62 | 0.082 | 0.931 | 0.039 | 0.979 | 0.053 |
| 0.971 | 0.66 | 0.081 | 0.905 | 0.038 | 0.971 | 0.052 |
| 0.954 | 0.70 | 0.078 | 0.879 | 0.035 | 0.954 | 0.052 |
| 0.936 | 0.73 | 0.074 | 0.853 | 0.038 | 0.936 | 0.048 |
| 0.866 | 0.80 | 0.074 | 0.827 | 0.037 | 0.866 | 0.044 |
| 0.797 | 0.84 | 0.067 | 0.801 | 0.037 | 0.797 | 0.042 |
| 0.727 | 0.86 | 0.065 | 0.775 | 0.036 | 0.727 | 0.039 |
| 0.657 | 0.89 | 0.060 | 0.672 | 0.035 | 0.657 | 0.039 |
| 0.587 | 0.91 | 0.056 | 0.568 | 0.032 | 0.587 | 0.036 |
| 0.517 | 0.93 | 0.050 | 0.465 | 0.030 | 0.517 | 0.034 |
| 0.447 | 0.95 | 0.046 | 0.362 | 0.028 | 0.447 | 0.032 |
| 0.378 | 0.97 | 0.045 | 0.258 | 0.024 | 0.378 | 0.030 |
| 0.378 | 0.96 | 0.046 | 0.155 | 0.023 | 0.378 | 0.031 |
| 0.308 | 0.97 | 0.042 | 0.052 | 0.024 | 0.308 | 0.028 |
| 0.238 | 0.99 | 0.037 | 0.000 | 0.022 | 0.238 | 0.025 |
| 0.238 | 0.98 | 0.039 |  |  | 0.238 | 0.027 |
| 0.168 | 0.99 | 0.034 |  |  | 0.168 | 0.026 |
| 0.098 | 1.00 | 0.034 |  |  | 0.098 | 0.024 |
| -0.006 | 1.00 | 0.031 |  |  | -0.006 | 0.022 |
| TABLE C-31. Liquid data 4mm, *Re* = 341,111, 0.69% V/V,  uc =5.37 m s-1 | | | | | | |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *r/R* | *u/uc* | *u'/uc* | *r/R* | *v'/uc* | *r/R* | *w'/uc* |
| 0.931 | 0.73 | 0.065 | 0.672 | 0.023 | 0.816 | 0.029 |
| 0.922 | 0.75 | 0.062 | 0.568 | 0.024 | 0.674 | 0.029 |
| 0.905 | 0.76 | 0.063 | 0.465 | 0.021 | 0.603 | 0.026 |
| 0.887 | 0.77 | 0.066 | 0.362 | 0.021 | 0.532 | 0.024 |
| 0.816 | 0.80 | 0.059 | 0.258 | 0.020 | 0.461 | 0.023 |
| 0.745 | 0.82 | 0.055 | 0.155 | 0.019 | 0.390 | 0.022 |
| 0.674 | 0.85 | 0.052 | 0.052 | 0.018 | 0.319 | 0.021 |
| 0.603 | 0.86 | 0.051 | 0.000 | 0.019 | 0.248 | 0.021 |
| 0.532 | 0.87 | 0.048 |  |  | 0.177 | 0.021 |
| 0.461 | 0.89 | 0.045 |  |  | 0.106 | 0.020 |
| 0.390 | 0.90 | 0.041 |  |  | 0.000 | 0.019 |
| 0.319 | 0.92 | 0.039 |  |  |  |  |
| 0.248 | 0.92 | 0.038 |  |  |  |  |
| 0.177 | 0.93 | 0.035 |  |  |  |  |
| 0.106 | 0.94 | 0.033 |  |  |  |  |
| 0.000 | 0.94 | 0.029 |  |  |  |  |
| TABLE C-32. Solid data 4mm, *Re* = 341,111, 0.69% V/V, uc =5.37 m s-1 | | | | | | |
|  | | | | | | |
| *r/R* | *u/uc* | *u'/uc* | *r/R* | *w'/uc* |
| 0.982 | 0.57 | 0.086 | 0.607 | 0.033 |
| 0.973 | 0.58 | 0.083 | 0.538 | 0.031 |
| 0.965 | 0.62 | 0.084 | 0.470 | 0.026 |
| 0.956 | 0.64 | 0.082 | 0.401 | 0.026 |
| 0.948 | 0.68 | 0.079 | 0.333 | 0.023 |
| 0.940 | 0.69 | 0.081 | 0.265 | 0.022 |
| 0.931 | 0.71 | 0.073 | 0.196 | 0.019 |
| 0.914 | 0.73 | 0.075 | -0.008 | 0.018 |
| 0.897 | 0.76 | 0.071 |  |  |
| 0.812 | 0.82 | 0.061 |  |  |
| 0.607 | 0.92 | 0.049 |  |  |
| 0.538 | 0.94 | 0.045 |  |  |
| 0.470 | 0.95 | 0.048 |  |  |
| 0.401 | 0.97 | 0.039 |  |  |
| 0.333 | 0.98 | 0.037 |  |  |
| 0.265 | 0.99 | 0.034 |  |  |
| 0.196 | 0.99 | 0.030 |  |  |
| -0.008 | 1.00 | 0.032 |  |  |
| TABLE C-33. Liquid data 4mm, *Re* = 322,303, 2.02% V/V,  uc =5.08 m s-1 | | | | | | |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *r/R* | *u/uc* | *u'/uc* | *r/R* | *v'/uc* | *r/R* | *w'/uc* |
| 0.943 | 0.71 | 0.062 | 0.775 | 0.022 | 0.900 | 0.031 |
| 0.935 | 0.71 | 0.060 | 0.672 | 0.022 | 0.875 | 0.029 |
| 0.926 | 0.72 | 0.063 | 0.568 | 0.020 | 0.857 | 0.030 |
| 0.909 | 0.73 | 0.061 | 0.465 | 0.018 | 0.788 | 0.028 |
| 0.900 | 0.74 | 0.059 | 0.362 | 0.016 | 0.718 | 0.025 |
| 0.875 | 0.76 | 0.062 | 0.258 | 0.015 | 0.648 | 0.021 |
| 0.857 | 0.77 | 0.060 | 0.155 | 0.015 | 0.509 | 0.019 |
| 0.788 | 0.80 | 0.050 | 0.052 | 0.015 | 0.562 | 0.022 |
| 0.718 | 0.83 | 0.045 | 0.000 | 0.016 | 0.492 | 0.019 |
| 0.648 | 0.85 | 0.038 |  |  | 0.353 | 0.018 |
| 0.509 | 0.86 | 0.036 |  |  | 0.283 | 0.015 |
| 0.562 | 0.85 | 0.036 |  |  | 0.214 | 0.016 |
| 0.492 | 0.86 | 0.036 |  |  | 0.144 | 0.016 |
| 0.423 | 0.88 | 0.030 |  |  | 0.075 | 0.015 |
| 0.353 | 0.89 | 0.028 |  |  | 0.005 | 0.015 |
| 0.283 | 0.90 | 0.027 |  |  | -0.004 | 0.016 |
| 0.214 | 0.90 | 0.026 |  |  |  |  |
| 0.144 | 0.91 | 0.024 |  |  |  |  |
| 0.075 | 0.92 | 0.025 |  |  |  |  |
| 0.005 | 0.92 | 0.024 |  |  |  |  |
| -0.004 | 0.92 | 0.023 |  |  |  |  |
| TABLE C-34. Solid data 4mm, *Re* = 322,303, 2.02% V/V, uc =5.08 m s-1 | | | | | | |

**5mm particles**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *r/R* | *u/uc* | *u'/uc* | *r/R* | *v'/uc* | *r/R* | *w'/uc* |
| 0.984 | 0.52 | 0.099 | 0.931 | 0.039 | 0.950 | 0.053 |
| 0.976 | 0.59 | 0.091 | 0.905 | 0.038 | 0.950 | 0.051 |
| 0.967 | 0.61 | 0.086 | 0.879 | 0.040 | 0.942 | 0.051 |
| 0.959 | 0.64 | 0.085 | 0.853 | 0.037 | 0.924 | 0.049 |
| 0.950 | 0.67 | 0.081 | 0.827 | 0.038 | 0.907 | 0.052 |
| 0.942 | 0.69 | 0.079 | 0.801 | 0.036 | 0.837 | 0.045 |
| 0.924 | 0.71 | 0.078 | 0.775 | 0.038 | 0.767 | 0.044 |
| 0.907 | 0.73 | 0.080 | 0.672 | 0.036 | 0.697 | 0.042 |
| 0.837 | 0.78 | 0.077 | 0.568 | 0.037 | 0.628 | 0.038 |
| 0.767 | 0.82 | 0.078 | 0.465 | 0.036 | 0.558 | 0.040 |
| 0.697 | 0.84 | 0.079 | 0.362 | 0.032 | 0.488 | 0.038 |
| 0.628 | 0.88 | 0.070 | 0.258 | 0.032 | 0.418 | 0.035 |
| 0.558 | 0.90 | 0.070 | 0.155 | 0.029 | 0.348 | 0.034 |
| 0.488 | 0.90 | 0.075 | 0.052 | 0.028 | 0.279 | 0.033 |
| 0.418 | 0.95 | 0.061 | -0.009 | 0.029 | 0.209 | 0.031 |
| 0.348 | 0.96 | 0.060 |  |  | 0.209 | 0.030 |
| 0.279 | 0.97 | 0.055 |  |  | 0.139 | 0.028 |
| 0.209 | 0.98 | 0.052 |  |  | 0.078 | 0.031 |
| 0.139 | 1.00 | 0.045 |  |  | -0.001 | 0.029 |
| 0.078 | 1.00 | 0.046 |  |  |  |  |
| -0.001 | 1.00 | 0.041 |  |  |  |  |
| TABLE C-35. Liquid data 5mm, *Re* = 194,583, 0.72% V/V,  uc =3.06 m s-1 | | | | | | |

|  |  |  |
| --- | --- | --- |
| *r/R* | *u/uc* | *u'/uc* |
| 0.895 | 0.67 | 0.054 |
| 0.877 | 0.68 | 0.056 |
| 0.859 | 0.68 | 0.052 |
| 0.842 | 0.68 | 0.055 |
| 0.771 | 0.69 | 0.057 |
| 0.700 | 0.68 | 0.060 |
| 0.629 | 0.70 | 0.060 |
| 0.558 | 0.71 | 0.059 |
| 0.487 | 0.74 | 0.059 |
| 0.416 | 0.75 | 0.062 |
| 0.345 | 0.77 | 0.053 |
| 0.274 | 0.79 | 0.053 |
| 0.203 | 0.81 | 0.050 |
| 0.132 | 0.82 | 0.047 |
| 0.007 | 0.85 | 0.043 |
| TABLE C-36. Solid data 5mm, *Re* = 194,583,  0.72% V/V, uc =3.06 m s-1 | | |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *r/R* | *u/uc* | *u'/uc* | *r/R* | *v'/uc* | *r/R* | *w'/uc* |
| 0.992 | 0.55 | 0.091 | 0.931 | 0.037 | 0.975 | 0.053 |
| 0.983 | 0.59 | 0.085 | 0.905 | 0.033 | 0.966 | 0.053 |
| 0.975 | 0.62 | 0.085 | 0.879 | 0.039 | 0.958 | 0.051 |
| 0.966 | 0.63 | 0.081 | 0.853 | 0.036 | 0.940 | 0.051 |
| 0.958 | 0.65 | 0.084 | 0.827 | 0.036 | 0.923 | 0.048 |
| 0.940 | 0.68 | 0.081 | 0.801 | 0.037 | 0.906 | 0.048 |
| 0.923 | 0.71 | 0.084 | 0.775 | 0.038 | 0.836 | 0.044 |
| 0.906 | 0.72 | 0.077 | 0.775 | 0.037 | 0.766 | 0.045 |
| 0.836 | 0.78 | 0.079 | 0.672 | 0.037 | 0.696 | 0.041 |
| 0.766 | 0.80 | 0.080 | 0.568 | 0.035 | 0.626 | 0.041 |
| 0.696 | 0.84 | 0.080 | 0.465 | 0.034 | 0.557 | 0.039 |
| 0.626 | 0.86 | 0.085 | 0.362 | 0.032 | 0.487 | 0.034 |
| 0.557 | 0.88 | 0.081 | 0.258 | 0.030 | 0.417 | 0.033 |
| 0.487 | 0.91 | 0.076 | 0.155 | 0.029 | 0.347 | 0.035 |
| 0.417 | 0.93 | 0.077 | 0.052 | 0.029 | 0.277 | 0.031 |
| 0.347 | 0.95 | 0.067 | 0.000 | 0.030 | 0.207 | 0.031 |
| 0.277 | 0.97 | 0.062 |  |  | 0.138 | 0.030 |
| 0.207 | 0.98 | 0.058 |  |  | 0.068 | 0.030 |
| 0.138 | 0.99 | 0.056 |  |  | -0.002 | 0.030 |
| 0.068 | 1.00 | 0.053 |  |  |  |  |
| -0.002 | 0.99 | 0.054 |  |  |  |  |
| TABLE C-37. Liquid data 5mm, *Re* = 196,114, 1.26% V/V,  uc =3.09 m s-1 | | | | | | |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *r/R* | *u/uc* | *u'/uc* | *r/R* | *v'/uc* | *r/R* | *w'/uc* |
| 0.850 | 0.64 | 0.060 | 0.931 | 0.018 | 0.850 | 0.026 |
| 0.833 | 0.64 | 0.061 | 0.905 | 0.021 | 0.833 | 0.026 |
| 0.762 | 0.65 | 0.065 | 0.879 | 0.021 | 0.762 | 0.025 |
| 0.691 | 0.65 | 0.068 | 0.827 | 0.022 | 0.691 | 0.026 |
| 0.620 | 0.67 | 0.063 | 0.775 | 0.022 | 0.620 | 0.026 |
| 0.549 | 0.69 | 0.068 | 0.672 | 0.026 | 0.549 | 0.029 |
| 0.478 | 0.73 | 0.067 | 0.568 | 0.025 | 0.478 | 0.027 |
| 0.407 | 0.74 | 0.060 | 0.465 | 0.026 | 0.407 | 0.026 |
| 0.336 | 0.76 | 0.060 | 0.362 | 0.027 | 0.336 | 0.026 |
| 0.265 | 0.77 | 0.061 | 0.258 | 0.026 | 0.265 | 0.027 |
| 0.194 | 0.79 | 0.054 | 0.155 | 0.028 | 0.194 | 0.028 |
| 0.123 | 0.80 | 0.051 | 0.052 | 0.027 | 0.123 | 0.027 |
| -0.001 | 0.82 | 0.047 | 0.004 | 0.026 | -0.001 | 0.026 |
| TABLE C-38. Solid data 5mm, *Re* = 194,114, 1.26% V/V, uc =3.09 m s-1 | | | | | | |

**Steel Particles**

**1 mm steel shot**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *r/R* | *u/uc* | *u'/uc* | *r/R* | *v'/uc* | *r/R* | *w'/uc* |
| 0.988 | 0.57 | 0.100 | 0.052 | 0.026 | 0.980 | 0.056 |
| 0.980 | 0.62 | 0.091 | 0.155 | 0.025 | 0.971 | 0.058 |
| 0.971 | 0.62 | 0.092 | 0.258 | 0.026 | 0.963 | 0.053 |
| 0.963 | 0.65 | 0.091 | 0.362 | 0.029 | 0.954 | 0.050 |
| 0.954 | 0.67 | 0.090 | 0.465 | 0.030 | 0.937 | 0.050 |
| 0.937 | 0.70 | 0.087 | 0.568 | 0.030 | 0.920 | 0.049 |
| 0.920 | 0.73 | 0.090 | 0.672 | 0.033 | 0.850 | 0.046 |
| 0.850 | 0.80 | 0.085 | 0.775 | 0.036 | 0.780 | 0.044 |
| 0.780 | 0.85 | 0.083 | 0.801 | 0.032 | 0.710 | 0.041 |
| 0.710 | 0.88 | 0.080 | 0.827 | 0.035 | 0.640 | 0.036 |
| 0.640 | 0.90 | 0.074 | 0.853 | 0.037 | 0.570 | 0.035 |
| 0.570 | 0.93 | 0.073 | 0.879 | 0.036 | 0.501 | 0.035 |
| 0.501 | 0.95 | 0.069 | 0.905 | 0.037 | 0.431 | 0.032 |
| 0.431 | 0.97 | 0.065 | 0.931 | 0.037 | 0.361 | 0.032 |
| 0.361 | 0.98 | 0.063 | 0.956 | 0.038 | 0.291 | 0.027 |
| 0.291 | 0.99 | 0.057 |  |  | 0.221 | 0.027 |
| 0.221 | 1.00 | 0.057 |  |  | 0.151 | 0.026 |
| 0.151 | 1.00 | 0.056 |  |  | 0.082 | 0.026 |
| 0.082 | 1.00 | 0.059 |  |  | 0.012 | 0.026 |
| 0.012 | 1.00 | 0.056 |  |  | 0.000 | 0.028 |
| 0.000 | 1.00 | 0.053 |  |  |  |  |
| TABLE C-39. Liquid data 1mm steel shot, *Re* = 180,347, 0.1% V/V,  uc =2.84 m s-1 | | | | | | |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *r/R* | *u/uc* | *u'/uc* | *r/R* | *v'/uc* | *r/R* | *w'/uc* |
| 0.968 | 0.56 | 0.081 | 0.052 | 0.024 | 0.959 | 0.038 |
| 0.959 | 0.57 | 0.073 | 0.155 | 0.023 | 0.950 | 0.038 |
| 0.950 | 0.57 | 0.077 | 0.258 | 0.024 | 0.942 | 0.037 |
| 0.942 | 0.58 | 0.072 | 0.362 | 0.025 | 0.933 | 0.036 |
| 0.933 | 0.59 | 0.078 | 0.465 | 0.024 | 0.915 | 0.035 |
| 0.915 | 0.59 | 0.078 | 0.568 | 0.027 | 0.898 | 0.035 |
| 0.898 | 0.59 | 0.081 | 0.672 | 0.027 | 0.827 | 0.030 |
| 0.827 | 0.66 | 0.083 | 0.775 | 0.028 | 0.755 | 0.031 |
| 0.755 | 0.71 | 0.078 | 0.801 | 0.027 | 0.684 | 0.029 |
| 0.684 | 0.74 | 0.077 | 0.853 | 0.033 | 0.613 | 0.028 |
| 0.613 | 0.77 | 0.068 | 0.879 | 0.033 | 0.542 | 0.027 |
| 0.542 | 0.78 | 0.068 | 0.905 | 0.028 | 0.471 | 0.027 |
| 0.471 | 0.80 | 0.059 | 0.931 | 0.028 | 0.400 | 0.026 |
| 0.400 | 0.81 | 0.059 | 0.956 | 0.027 | 0.329 | 0.025 |
| 0.329 | 0.82 | 0.058 | 0.982 | 0.027 | 0.258 | 0.026 |
| 0.258 | 0.83 | 0.056 |  |  | 0.187 | 0.025 |
| 0.187 | 0.85 | 0.051 |  |  | 0.116 | 0.023 |
| 0.116 | 0.86 | 0.046 |  |  | 0.045 | 0.024 |
| 0.045 | 0.86 | 0.045 |  |  | -0.008 | 0.023 |
| -0.008 | 0.87 | 0.042 |  |  |  |  |
| TABLE C-40. Solid data 1mm steel shot, *Re* = 180,347, 0.1% V/V,  uc =2.84 m s-1 | | | | | | |

**1x1 mm steel particles**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *r/R* | *u/uc* | *u'/uc* | *r/R* | *v'/uc* | *r/R* | *w'/uc* |
| 0.982 | 0.61 | 0.088 | 0.052 | 0.026 | 0.982 | 0.056 |
| 0.973 | 0.62 | 0.085 | 0.155 | 0.026 | 0.973 | 0.059 |
| 0.964 | 0.65 | 0.086 | 0.258 | 0.028 | 0.964 | 0.057 |
| 0.956 | 0.68 | 0.085 | 0.362 | 0.029 | 0.956 | 0.053 |
| 0.947 | 0.68 | 0.086 | 0.465 | 0.032 | 0.947 | 0.055 |
| 0.930 | 0.70 | 0.088 | 0.568 | 0.033 | 0.930 | 0.053 |
| 0.913 | 0.74 | 0.085 | 0.672 | 0.035 | 0.913 | 0.050 |
| 0.843 | 0.81 | 0.078 | 0.775 | 0.034 | 0.843 | 0.045 |
| 0.773 | 0.85 | 0.081 | 0.827 | 0.036 | 0.773 | 0.043 |
| 0.703 | 0.88 | 0.074 | 0.853 | 0.032 | 0.703 | 0.038 |
| 0.633 | 0.90 | 0.073 | 0.879 | 0.036 | 0.633 | 0.039 |
| 0.563 | 0.92 | 0.069 | 0.905 | 0.035 | 0.563 | 0.035 |
| 0.494 | 0.94 | 0.062 | 0.931 | 0.036 | 0.494 | 0.034 |
| 0.424 | 0.96 | 0.060 | 0.956 | 0.036 | 0.424 | 0.034 |
| 0.354 | 0.97 | 0.056 |  |  | 0.354 | 0.031 |
| 0.284 | 0.98 | 0.051 |  |  | 0.284 | 0.028 |
| 0.214 | 0.99 | 0.052 |  |  | 0.214 | 0.028 |
| 0.144 | 1.00 | 0.048 |  |  | 0.144 | 0.026 |
| 0.075 | 1.00 | 0.048 |  |  | 0.075 | 0.026 |
| 0.001 | 1.00 | 0.045 |  |  | 0.001 | 0.027 |
| TABLE C-41. Liquid data 1 mm x1mm steel, *Re* = 183,154, 0.09% V/V, uc =2.88 m s-1 | | | | | | |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *r/R* | *u/uc* | *u'/uc* | *r/R* | *v'/uc* | *r/R* | *w'/uc* |
| 0.955 | 0.60 | 0.074 | 0.052 | 0.025 | 0.955 | 0.041 |
| 0.946 | 0.61 | 0.075 | 0.155 | 0.024 | 0.946 | 0.038 |
| 0.938 | 0.62 | 0.076 | 0.258 | 0.024 | 0.938 | 0.036 |
| 0.920 | 0.63 | 0.079 | 0.362 | 0.024 | 0.920 | 0.035 |
| 0.902 | 0.66 | 0.082 | 0.465 | 0.027 | 0.902 | 0.034 |
| 0.831 | 0.70 | 0.079 | 0.568 | 0.027 | 0.831 | 0.035 |
| 0.760 | 0.75 | 0.079 | 0.672 | 0.027 | 0.760 | 0.033 |
| 0.689 | 0.77 | 0.075 | 0.775 | 0.028 | 0.689 | 0.031 |
| 0.618 | 0.81 | 0.070 | 0.801 | 0.028 | 0.618 | 0.028 |
| 0.547 | 0.82 | 0.064 | 0.827 | 0.030 | 0.547 | 0.030 |
| 0.476 | 0.84 | 0.065 | 0.853 | 0.029 | 0.476 | 0.029 |
| 0.405 | 0.85 | 0.062 | 0.879 | 0.028 | 0.405 | 0.028 |
| 0.334 | 0.87 | 0.057 | 0.905 | 0.033 | 0.334 | 0.029 |
| 0.263 | 0.89 | 0.052 | 0.931 | 0.028 | 0.263 | 0.027 |
| 0.121 | 0.89 | 0.053 | 0.956 | 0.027 | 0.121 | 0.027 |
| 0.050 | 0.91 | 0.045 | 0.982 | 0.026 | 0.050 | 0.026 |
| -0.002 | 0.92 | 0.045 |  | 0.026 | -0.002 | 0.025 |
| TABLE C-42. Solid data 1 mm x1mm steel, *Re* = 183,154, 0.09% V/V,  uc =2.88 m s-1 | | | | | | |

**0.5 mm x 4 mm steel**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| *r/R* | *u/uc* | *u'/uc* | *r/R* | *w'/uc* |
| 0.983 | 0.59 | 0.088 | 0.966 | 0.056 |
| 0.975 | 0.59 | 0.092 | 0.958 | 0.054 |
| 0.966 | 0.60 | 0.079 | 0.949 | 0.054 |
| 0.958 | 0.64 | 0.088 | 0.932 | 0.054 |
| 0.949 | 0.66 | 0.088 | 0.914 | 0.050 |
| 0.932 | 0.69 | 0.088 | 0.844 | 0.047 |
| 0.914 | 0.71 | 0.085 | 0.775 | 0.043 |
| 0.844 | 0.78 | 0.082 | 0.705 | 0.041 |
| 0.775 | 0.83 | 0.080 | 0.635 | 0.040 |
| 0.705 | 0.87 | 0.074 | 0.565 | 0.039 |
| 0.635 | 0.89 | 0.073 | 0.495 | 0.039 |
| 0.565 | 0.91 | 0.067 | 0.426 | 0.037 |
| 0.495 | 0.93 | 0.064 | 0.356 | 0.034 |
| 0.426 | 0.95 | 0.060 | 0.286 | 0.033 |
| 0.356 | 0.96 | 0.058 | 0.216 | 0.030 |
| 0.286 | 0.97 | 0.050 | 0.146 | 0.029 |
| 0.216 | 0.98 | 0.049 | 0.076 | 0.028 |
| 0.146 | 0.99 | 0.050 | -0.011 | 0.029 |
| 0.076 | 1.00 | 0.043 |  |  |
| -0.011 | 1.00 | 0.043 |  |  |
| TABLE C-43. Liquid data 0.5 mm x 4 mm steel, *Re* = 185,211, 0.11% V/V, uc =2.92 m s-1 | | | | |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *r/R* | *u/uc* | *u'/uc* | *r/R* | *v'/uc* | *r/R* | *w'/uc* |
| 0.949 | 0.57 | 0.067 | 0.052 | 0.033 | 0.949 | 0.041 |
| 0.940 | 0.57 | 0.072 | 0.155 | 0.034 | 0.940 | 0.042 |
| 0.931 | 0.58 | 0.072 | 0.258 | 0.033 | 0.931 | 0.042 |
| 0.914 | 0.60 | 0.078 | 0.362 | 0.035 | 0.914 | 0.041 |
| 0.896 | 0.61 | 0.076 | 0.465 | 0.035 | 0.896 | 0.041 |
| 0.825 | 0.68 | 0.078 | 0.568 | 0.036 | 0.825 | 0.042 |
| 0.754 | 0.72 | 0.071 | 0.672 | 0.037 | 0.754 | 0.041 |
| 0.683 | 0.75 | 0.073 | 0.775 | 0.042 | 0.683 | 0.039 |
| 0.612 | 0.77 | 0.069 | 0.801 | 0.037 | 0.612 | 0.039 |
| 0.541 | 0.79 | 0.070 | 0.827 | 0.038 | 0.541 | 0.038 |
| 0.470 | 0.82 | 0.063 | 0.853 | 0.035 | 0.470 | 0.036 |
| 0.399 | 0.83 | 0.063 | 0.879 | 0.036 | 0.399 | 0.037 |
| 0.328 | 0.85 | 0.062 | 0.905 | 0.031 | 0.328 | 0.036 |
| 0.257 | 0.87 | 0.056 | 0.931 | 0.035 | 0.257 | 0.034 |
| 0.186 | 0.88 | 0.048 |  |  | 0.186 | 0.034 |
| 0.115 | 0.88 | 0.047 |  |  | 0.115 | 0.033 |
| 0.044 | 0.89 | 0.042 |  |  | 0.044 | 0.033 |
| 0.017 | 0.89 | 0.044 |  |  | 0.017 | 0.032 |
| TABLE C-44. Solid data 0.5 mm x 4 mm steel, *Re* = 185,211, 0.11% V/V, uc =2.92 m s-1 | | | | | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| *r/R* | *u/uc* | *u'/uc* | *r/R* | *w'/uc* |
| 0.971 | 0.62 | 0.087 | 0.919 | 0.053 |
| 0.954 | 0.67 | 0.090 | 0.849 | 0.047 |
| 0.937 | 0.70 | 0.092 | 0.780 | 0.046 |
| 0.919 | 0.72 | 0.086 | 0.640 | 0.042 |
| 0.849 | 0.80 | 0.090 | 0.500 | 0.040 |
| 0.780 | 0.85 | 0.085 | 0.361 | 0.036 |
| 0.710 | 0.87 | 0.082 | 0.221 | 0.035 |
| 0.640 | 0.90 | 0.081 | 0.151 | 0.031 |
| 0.570 | 0.91 | 0.075 | 0.081 | 0.030 |
| 0.500 | 0.94 | 0.072 | 0.011 | 0.031 |
| 0.430 | 0.95 | 0.067 | 0.002 | 0.031 |
| 0.361 | 0.97 | 0.063 | -0.004 | 0.031 |
| 0.291 | 0.98 | 0.061 |  |  |
| 0.221 | 0.99 | 0.061 |  |  |
| 0.151 | 1.00 | 0.052 |  |  |
| 0.081 | 1.00 | 0.053 |  |  |
| 0.011 | 1.00 | 0.054 |  |  |
| 0.002 | 1.00 | 0.054 |  |  |
| -0.004 | 1.00 | 0.055 |  |  |
| TABLE C-45. Liquid data 0.5 mm x 4 mm steel, *Re* = 176,772, 0.22% V/V, uc =2.78 m s-1 | | | | |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *r/R* | *u/uc* | *u'/uc* | *r/R* | *v'/uc* | *r/R* | *w'/uc* |
| 0.940 | 0.57 | 0.074 | 0.052 | 0.033 | 0.940 | 0.044 |
| 0.931 | 0.58 | 0.076 | 0.155 | 0.036 | 0.931 | 0.044 |
| 0.922 | 0.59 | 0.080 | 0.258 | 0.035 | 0.922 | 0.043 |
| 0.914 | 0.60 | 0.080 | 0.362 | 0.035 | 0.914 | 0.044 |
| 0.896 | 0.62 | 0.086 | 0.465 | 0.035 | 0.896 | 0.046 |
| 0.878 | 0.63 | 0.082 | 0.568 | 0.036 | 0.878 | 0.043 |
| 0.807 | 0.70 | 0.084 | 0.672 | 0.035 | 0.807 | 0.041 |
| 0.736 | 0.74 | 0.081 | 0.775 | 0.044 | 0.736 | 0.043 |
| 0.665 | 0.76 | 0.081 | 0.801 | 0.035 | 0.665 | 0.039 |
| 0.594 | 0.79 | 0.076 | 0.827 | 0.037 | 0.594 | 0.040 |
| 0.523 | 0.81 | 0.074 | 0.853 | 0.033 | 0.523 | 0.039 |
| 0.452 | 0.82 | 0.071 | 0.879 | 0.037 | 0.452 | 0.038 |
| 0.381 | 0.84 | 0.067 | 0.905 | 0.034 | 0.381 | 0.038 |
| 0.310 | 0.86 | 0.063 | 0.931 | 0.033 | 0.310 | 0.037 |
| 0.239 | 0.86 | 0.061 |  |  | 0.239 | 0.036 |
| 0.168 | 0.88 | 0.060 |  |  | 0.168 | 0.036 |
| 0.097 | 0.89 | 0.054 |  |  | 0.097 | 0.034 |
| 0.026 | 0.89 | 0.053 |  |  | 0.026 | 0.034 |
| -0.009 | 0.90 | 0.054 |  |  | -0.009 | 0.035 |
| TABLE C-46. Solid data 0.5 mm x 4 mm steel, *Re* = 176,772, 0.22% V/V, uc =2.78 m s-1 | | | | | | |