
Supplemental Material for

A scale-wise analysis of intermittent momentum transport in dense canopy flows

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Supplemental figures

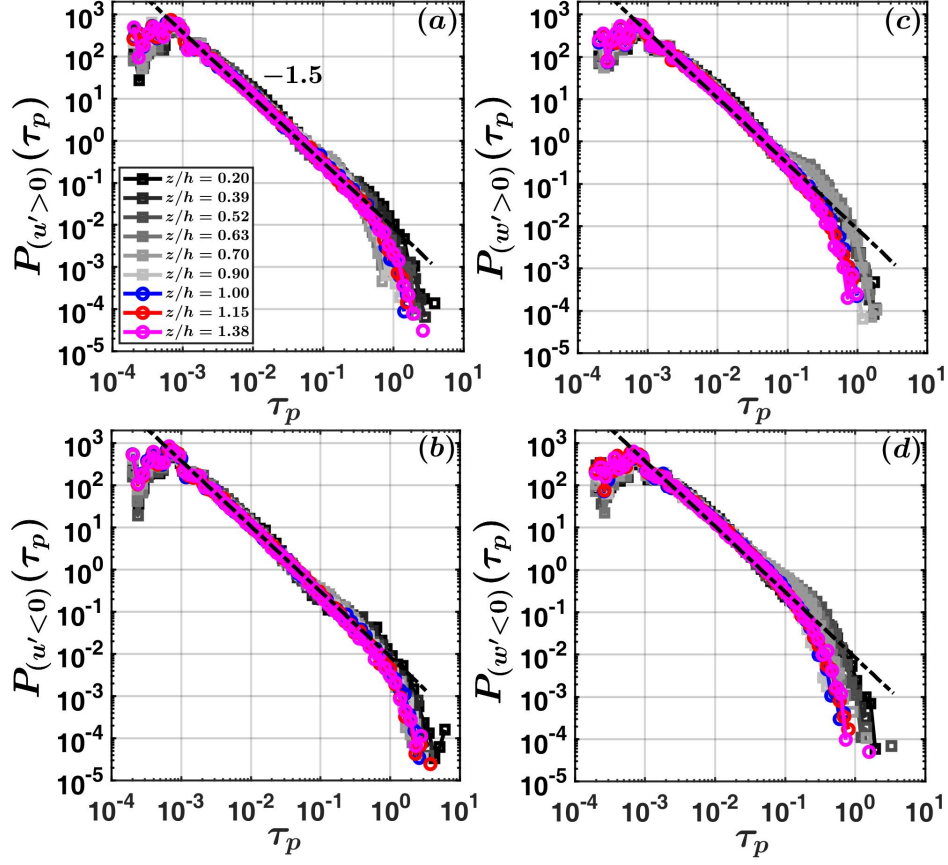


Fig. S1. The persistence PDFs are shown for events in (a) $u' > 0$, (b) $u' < 0$, (c) $w' > 0$, and (d) $w' < 0$ signals, corresponding to the heights within and above the canopy. The normalized persistence time scales $(t_p u_*)/h$ are denoted as τ_p and their PDFs are constructed over the ensemble of 93 half-hour blocks from near-neutral conditions. Gray-coloured squares of various shades denote the heights within the canopy ($z/h < 1$), whereas the heights at and above the canopy ($z/h \geq 1$) are represented by blue-, red-, and pink-coloured circles (see the legend in (a)). A power-law of exponent -1.5 is fitted to the persistence PDFs and shown in dash-dotted black lines.

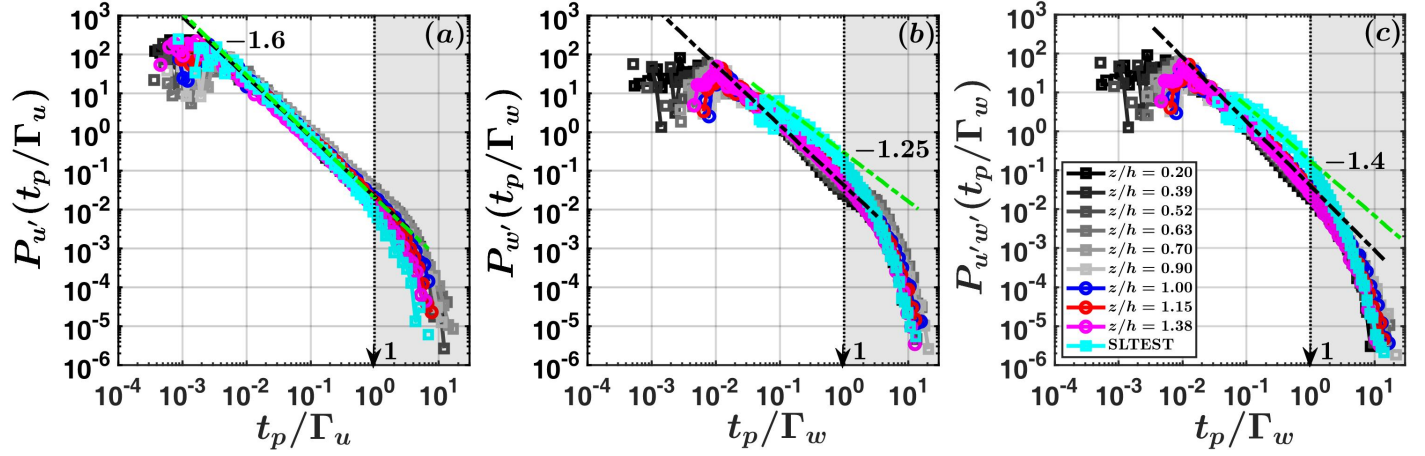


Fig. S2. The persistence PDFs are shown for the events occurring in (a) u' , (b) w' , and (c) $u'w'$ signals, corresponding to the heights within and above the canopy. The persistence time scales t_p are normalized by Γ_u or Γ_w . Note that, for the momentum flux signals all the four quadrant events are considered together. The PDFs of t_p/Γ_x from the near-neutral SLTEST dataset are overlaid on all the panels as cyan dash-dotted lines (see the legend in (c)). For the SLTEST dataset, power-laws of exponents -1.6 , -1.25 , and -1.4 are fitted to the persistence PDFs of u' , w' , $u'w'$ events and shown as dash-dotted green lines.

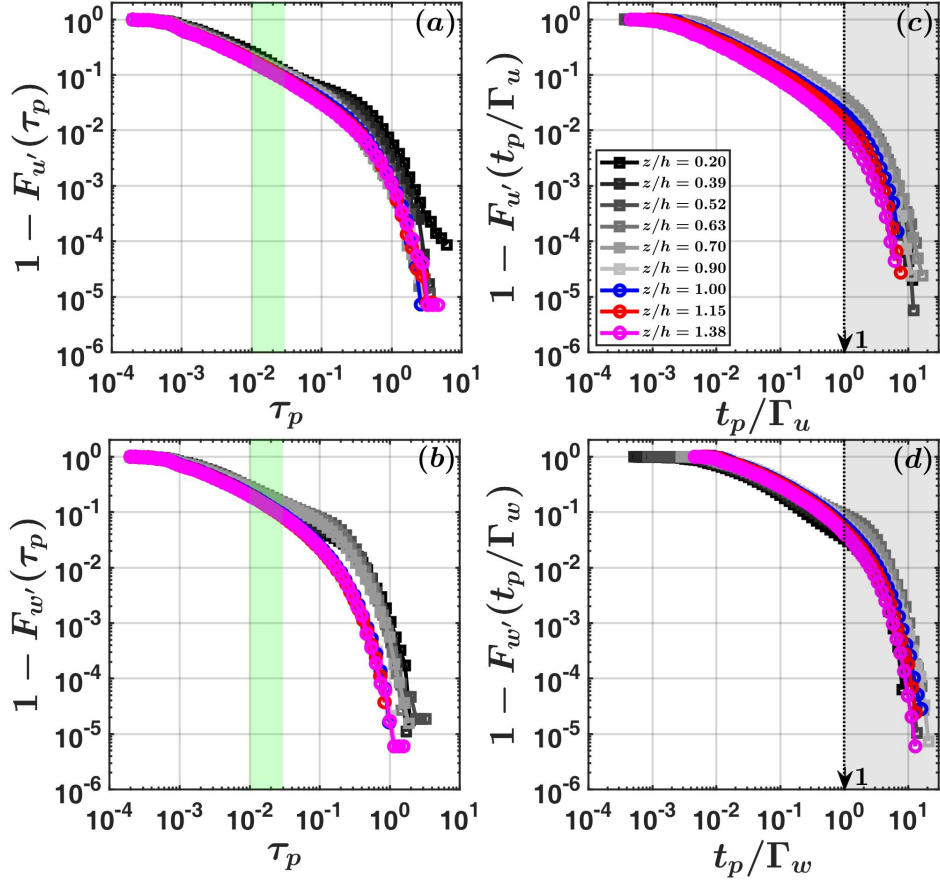


Fig. S3. The complementary cumulative distribution functions (CCDFs) of τ_p are shown for the events occurring in (a) u' , and (b) w' signals, corresponding to the heights within and above the canopy. The green-shaded regions in (a) and (b) denote the range over which $\overline{\tau_p}$ (overline indicates the mean) varies across the nine measurement heights. On the other hand, CCDFs of t_p/Γ_x (Γ_x is the integral time scale of $x = u$ or w) are shown for (c) u' , and (d) w' signals.

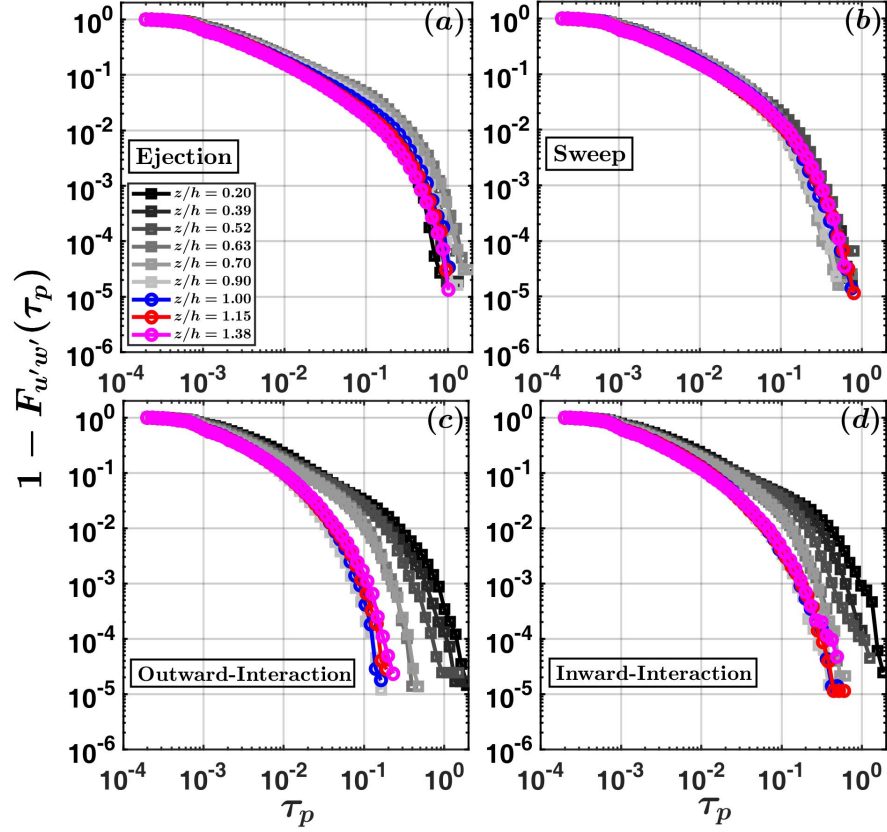


Fig. S4. The CCDFs of τ_p are shown for the four different $u'-w'$ quadrant events namely, (a) ejection, (b) sweep, (c) outward interaction, and (d) inward interaction. The colours denoting different heights within and above the canopy are indicated in the legend of (a).

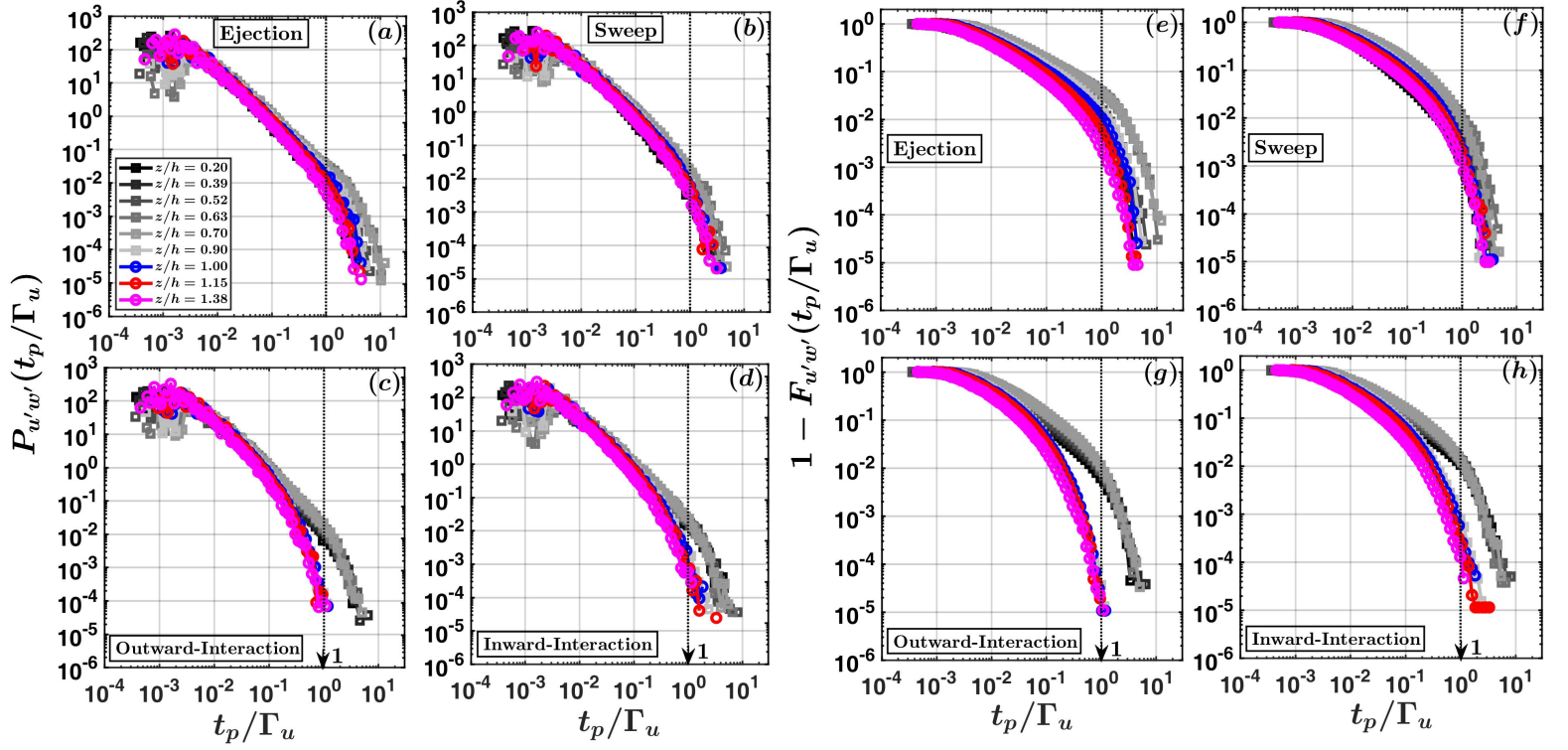


Fig. S5. The persistence PDFs and CCDFs of t_p/Γ_u are shown for the four different $u'-w'$ quadrant events. The colours denoting different heights within and above the canopy are indicated in the legend of (a).

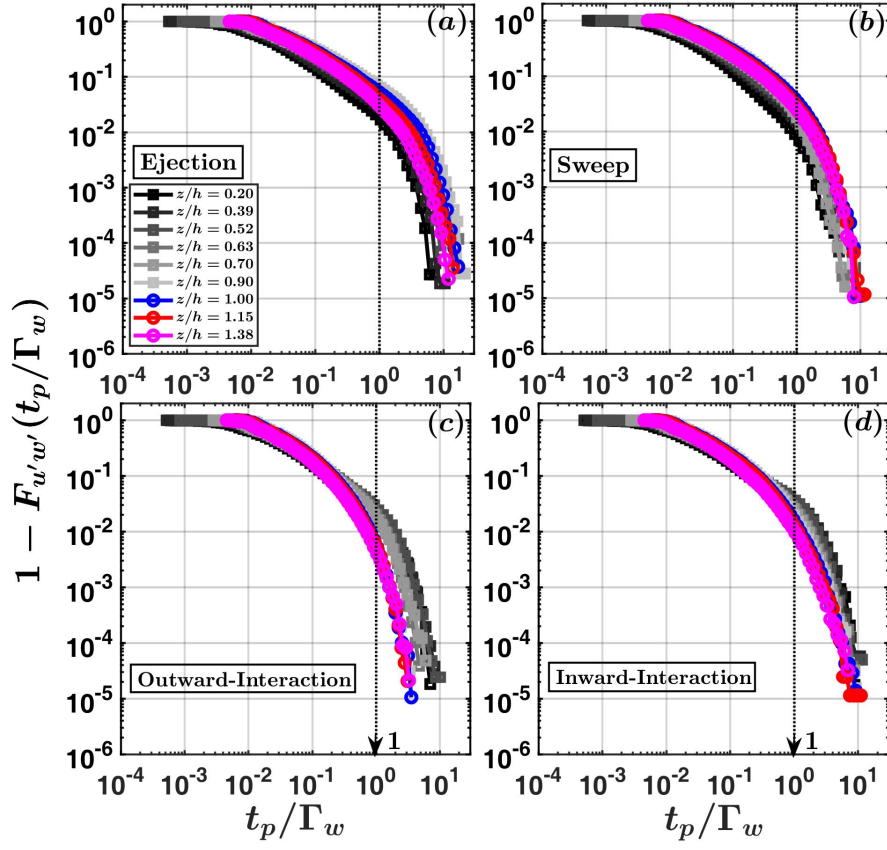


Fig. S6. Same as in Fig. S4 but for the CCDFs of t_p/Γ_w .