**Annual variation of temperature and mass balance of first-year and second-year land-fast sea ice in Prydz Bay, East Antarctica**

Dinglong Zhao1,2, Bin Cheng3, Matti Leppäranta4, Jingkai Ma5, Xuejing Chen6, Jiechen Zhao7,2\*

**Table S1.** The basic equations and parameters of the model

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| Description | Equation |
| The partial differential heat transfer equations for the snow and ice layers |  |
| Surface Heat and Mass Balance |  |
| Ice bottom Heat and Mass Balance |  |
| Snow/ice Interface and Mass Balance |  |
| Parameter | and : Snow and ice;  : The vertical axis;  : The time;  : The temperature;  : The density;  : The specific heat;  : The thermal conductivity;  : The amount of incoming solar radiation penetrating below the snow and ice surface;  : Downward solar radiation for all sky condition;  and : Downward and upward longwave radiation under all sky conditions;  and : Turbulent sensible and latent heat fluxes;  *Fm*: Surface melting of snow or ice;  *Fc*: The conductive heat flux of the surface layer;  : Surface temperature;  : Snow/ice surface albedo;  : Sea-ice thickness;  : Latent heat of fusion;  : Oceanic heat flux;  : Density of snow-ice/ superimposed ice;  : Thermal conductivity of snow;  : Thermal conductivity of sea ice;  : Superimposed ice thickness |