

Supporting Information for "Modeling ice melt rates from seawater intrusions in the grounding zone of Petermann Gletscher, Greenland"

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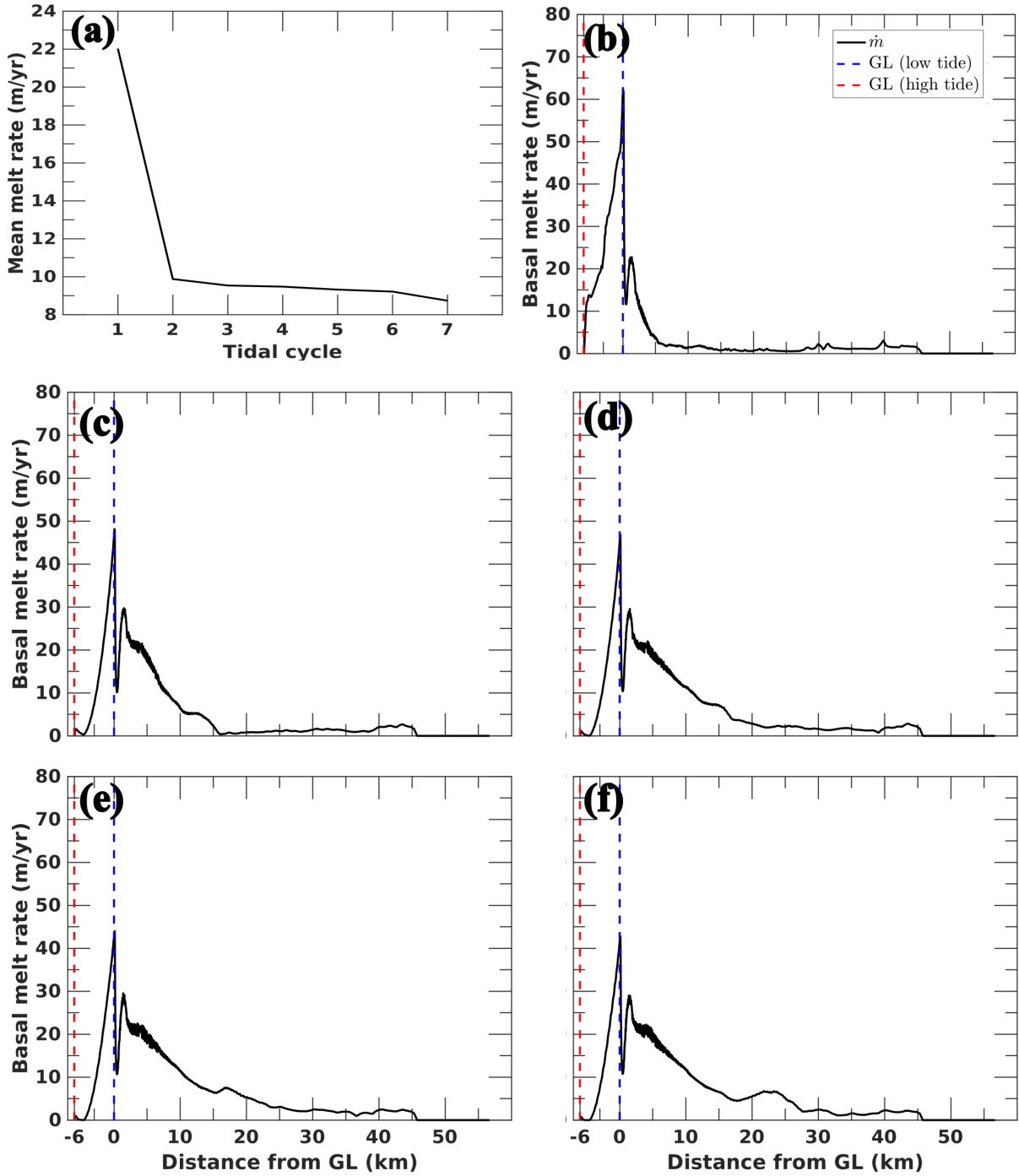


Figure S1. Multiple cycles of ice melt rate in the grounding zone of Petermann Gletscher, Greenland. The GZ width is 6 km. Thermal forcing is 2.25°C. (a) Mean melt rate, \dot{m} , (in meters per year) versus tidal cycle. (b) melt rate for the first cycle from low (blue dotted line) to high tide (red dotted line) vs distance from the low-tide grounding line. (c-f) are the same as (a) for cycles 2-5.

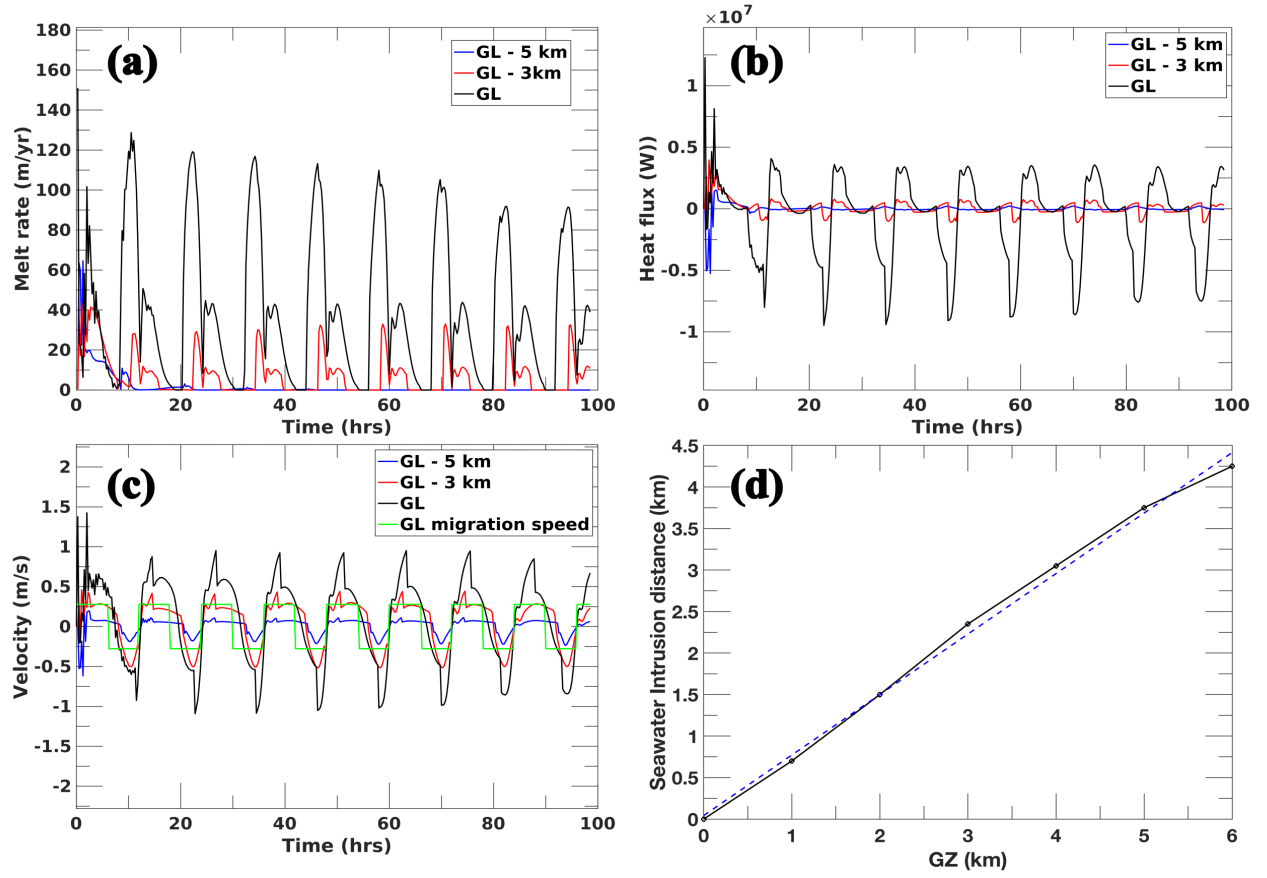


Figure S2. Time dependence of modeled melt rates in the grounding zone of **Petermann Gletscher, Greenland**. Thermal forcing is 2.25°C . GZ width is 6 km. (a) melt rate (in meters per year), (b) heat flux (in watts), and (c) water speed (in meters per second) at the low-tide GL, 3 km into the cavity, and at the end of the cavity for multiple tidal cycles. (d) Length of seawater intrusions versus GZ width as a black solid line with a linear fit in blue dotted line. The slope of the linear fit comes to 72.9%

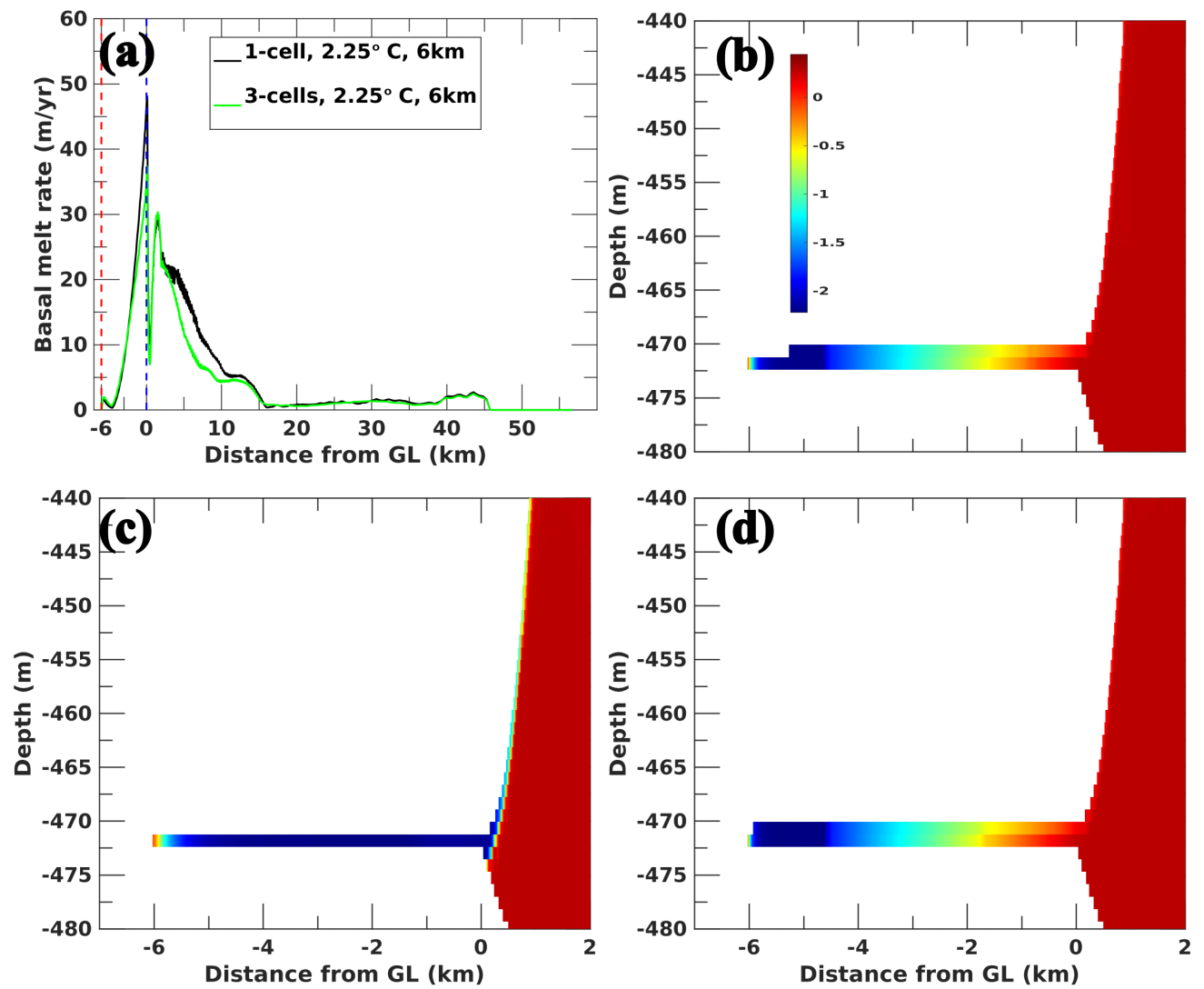


Figure S3. Modeled melt rates within the grounding zone of Petermann Gletscher, Greenland, with 1 vertical cell versus 3 vertical cells. The GZ width is 6 km. Thermal forcing is 2.25°C . (a) Basal melt rate in meters per year for 1-cell (blue), 3-cells (green), no GZ (magenta), with low-tide GL position in dotted blue and high tide in dotted red. Water temperature versus depth in the cavity for (b) 12 hours, (c) 18 hours, and (d) 24 hours.

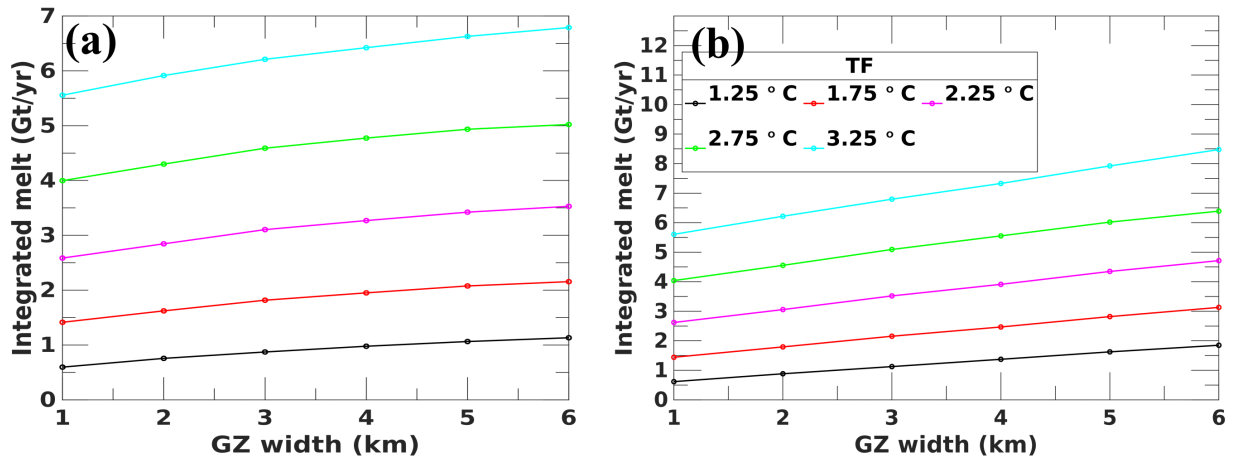


Figure S4. Modeled integrated melt of the Petermann Gletscher. in (a) the flexure zone and, (b) the grounding and flexure zone, as a function of the grounding zone (GZ) width and for different ocean thermal forcing, TF . Each diamond is one simulation with a linear fit in between the simulations.