Supplementary information for

Sources of oceanic and volcanic heat melting a subglacial channel in Kamb Ice Stream, West Antarctica

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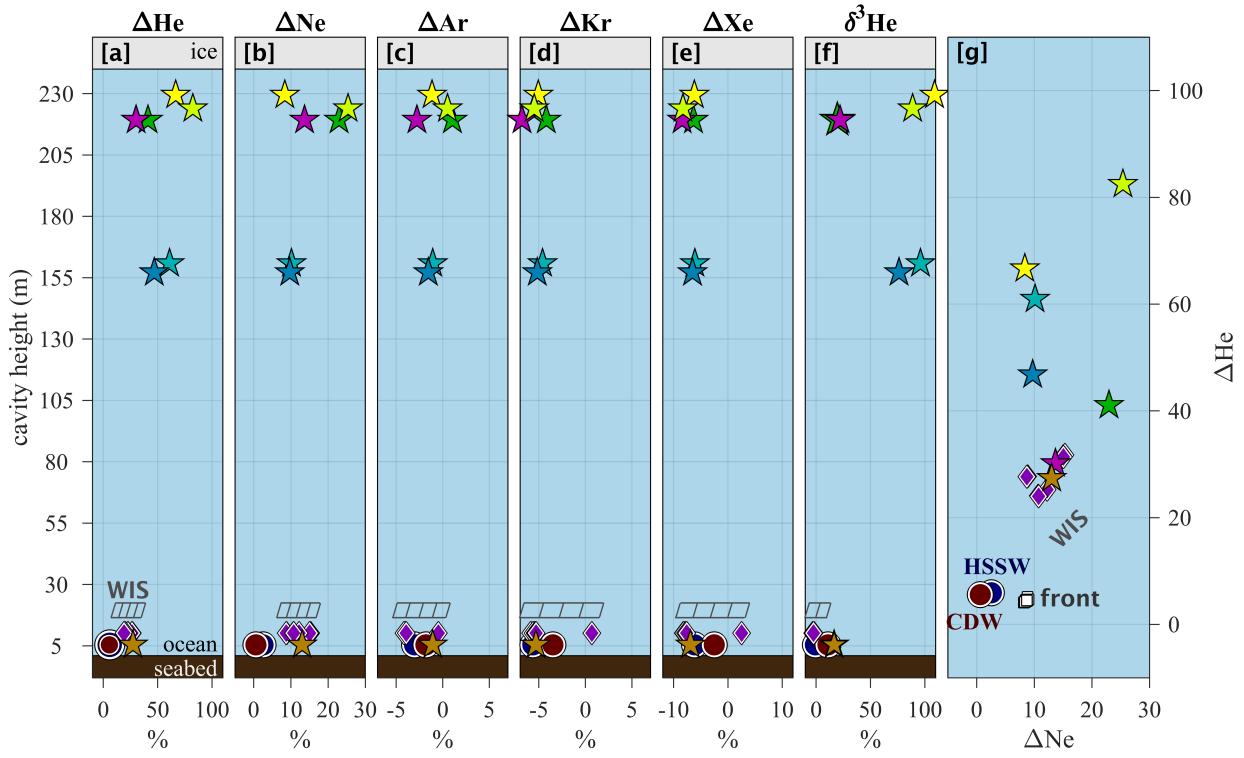
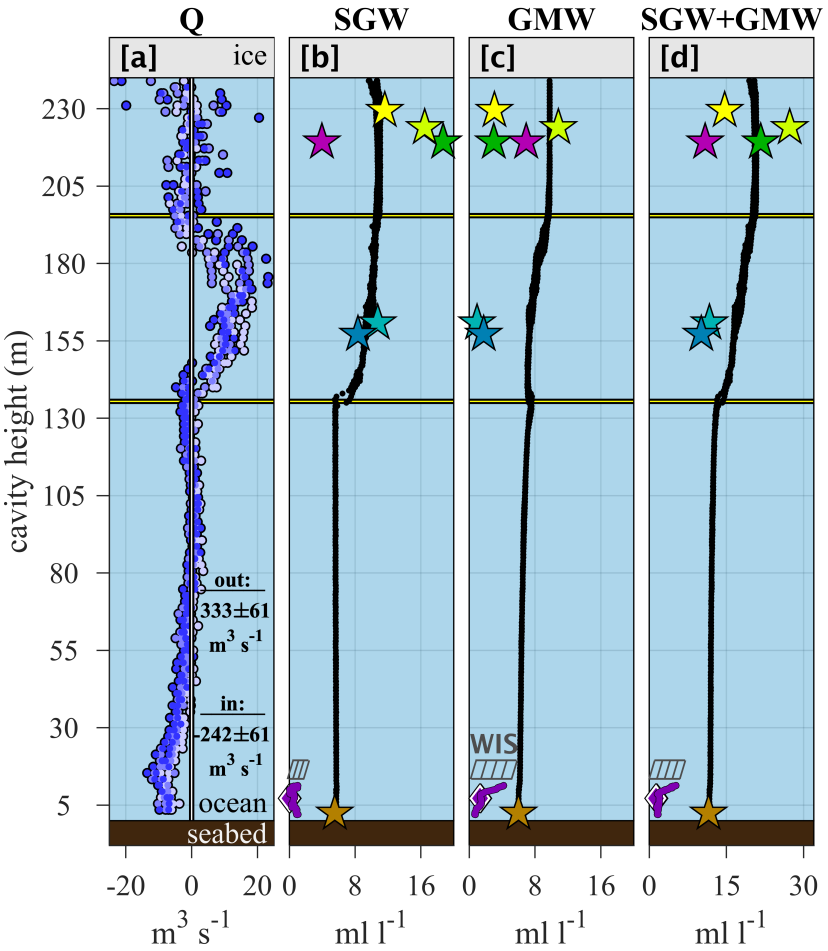


Supplementary Fig. 1 | Noble gas saturation anomalies in the subglacial channel cavity. Saturation anomalies ($\Delta = (C_{obs}/C_{eq} - 1) \times 100$) of **(a)** helium (He), **(b)** neon (NE), **(c)** argon (Ar), **(d)** krypton (Kr), **(e)** xenon (Xe), and **(f)** ^{3}helium/^{4}helium isotopic percent deviation from atmospheric values (δ^3He) from water samples collected at discrete depths. **(g)** ΔHe - ΔNe diagram of data shown in **(a, b)**. The burgundy and navy-blue circles represent values for CDW and HSSW, respectively. CDW values come from refs. 17,26 and HSSW values come from a water sample collected in McMurdo Sound. Additional data come from the WIS GL (purple diamonds, ref. 25) and the Ross Ice Shelf front (white squares, ref. 18). Note that one sample from WIS contained

anomalously high ΔAr, ΔKr, and ΔXe levels and is excluded from further analysis. See Fig. 1a for the geographic locations of samples.



Supplementary Fig. 2 | Concentrations of meltwater in the subglacial channel cavity. (a) Vertical profiles of water volume flux (Q) through the channel and concentrations of **(b)** glacial meltwater (GMW), **(c)** subglacial freshwater (SGW), and **(d)** total meltwater (GMW + SGW). Concentrations from discrete water samples (stars) are estimated with an OMP analysis and vertical profiles are estimated with temperature and salinity. The GMW and SGW profiles in the channel have been adjusted with the OMP-derived concentration in the bottom water sample near the seabed. The WIS channels have not, because no samples were collected at the seabed.