

Figure F1. A. Photograph of a Kapton-insulated Hot Disk sensor (Model 5465), showing the 6.4 mm diameter spiral-shaped heating element and temperature sensor (image source: Hot Disk Instruments). B. Schematic of the single-sided measurement configuration: the sensor rests on the sample's prepared surface and is covered by an EPS disk ($\lambda_{\text{EPS}} \approx 0.032 \text{ W/(m}\cdot\text{K)}$) that provides thermal insulation and transmits gentle, uniform compression. Separation between elements is shown here only for illustrative purposes. The setup is enclosed to limit ambient temperature fluctuations.

Figure F2. Example data set and model fit for five repeated runs (405-C0019J-61K-1W, 13.0–15.0 cm). Top: temperature rise ΔT as a function of time t . Middle: linearization of the same data versus the dimensionless function $H(\tau)$, illustrating the procedure used to estimate α from the best straight-line collapse and λ from the slope with the single-sided formulation. Bottom: residuals versus \sqrt{t} ; the mean residual meets the quality criterion ($<10^{-3}\text{ }^\circ\text{C}$).

Figure F3. Thermal properties versus depth, Site C0019. Black dots = measurements from this study. Error bars of $\pm 1\sigma$ from replicate runs are smaller than the

symbol size and thus are not plotted. Cyan circles = shipboard λ from the Site C0019 chapter (Regalla et al., 2025), red circles = JFAST laboratory results (Lin et al., 2014). Error bars are $\pm 1\sigma$ from replicate runs and are commonly smaller than the symbols.

Figure F4. Thermal properties versus depth, Site C0026. Black dots = measurements from this study. Error bars of $\pm 1\sigma$ from replicate runs are smaller than the symbol size and thus are not plotted. Cyan circles = shipboard λ from the Site C0026 chapter (Conin et al., 2025).

Figure F5. Cross-property relationships for all samples measured in this study (black dots) with JFAST points from Lin et al. (2014) shown as open red circles. A. Thermal diffusivity α ($\times 10^{-7} \text{ m}^2/\text{s}$) versus thermal conductivity λ ($\text{W/(m}\cdot\text{K)}$). Cyan curve = the empirical α – λ relationship of Hyndman et al. (1979). B. Volumetric heat capacity ρc ($\text{MJ/(m}^3\cdot\text{K)}$) versus λ . Error bars of $\pm 1\sigma$ are generally smaller than the symbol size and are thus not plotted.