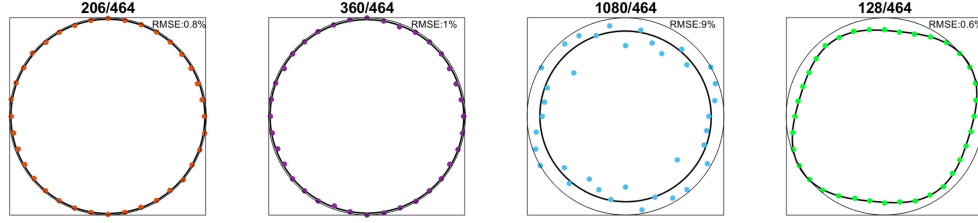
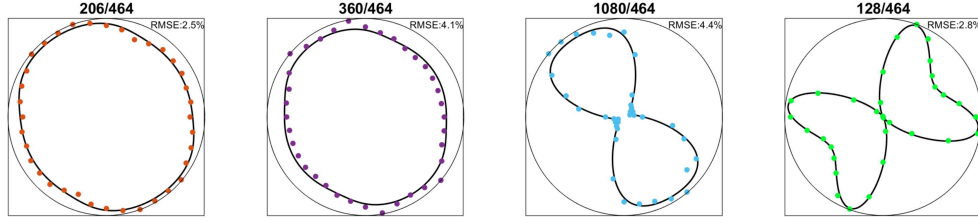


Parallel



Bunge angle:
Phi1: 154.2
Psi: 1.7
Phi2: 97.5

Perpendicular



Bunge angle:
Phi1: 31.7
Psi: 88.0
Phi2: 0.2

Figure S1. Orientation of crystals determined by relative Raman intensities. Parallel and perpendicular cuts are defined with respect to the c -axis. Orientation of the c -axis (top) and the perpendicular to the a -axis (bottom) is within 2° of the normal to the compression face (vertical direction).

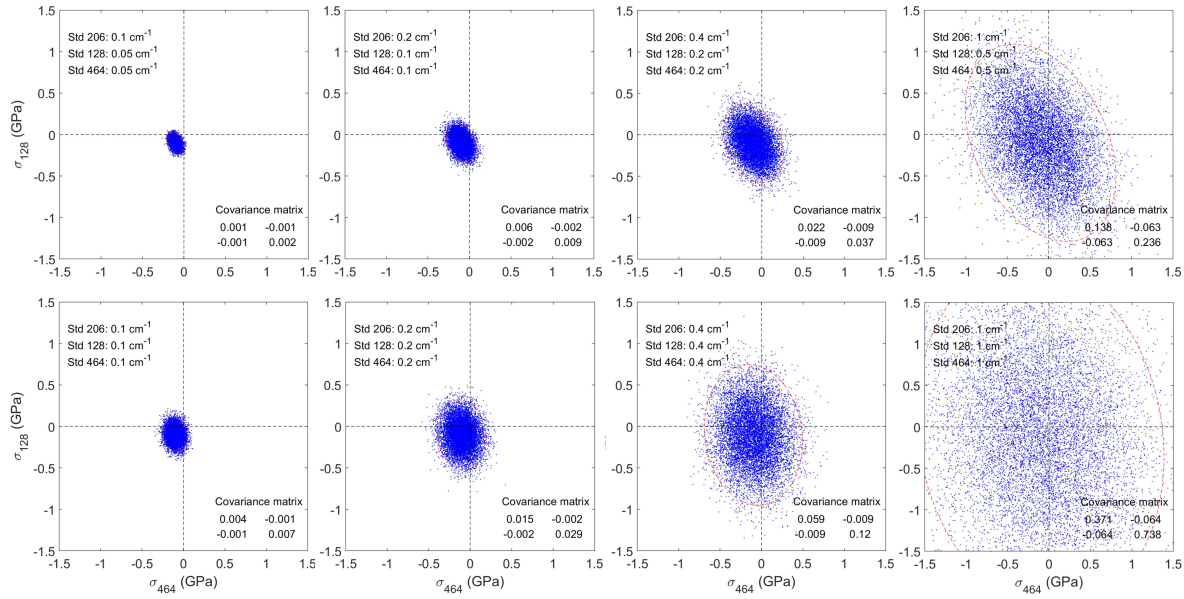


Fig. S2. Sensitivity analysis for calculated differential stresses σ using the position of the 128 and 464 cm^{-1} peaks (equations 13,14). Raman band position is calculated using Eq. 2 and the inverted Eq. 13 and 14 at a given stress state, here set as $P = 1\text{GPa}$ and $\sigma = -0.1\text{GPa}$. Subsequently a Gaussian noise is added to the calculated Raman band position, and Eq. 1, 13 and 14 are again used to calculate differential stress. This is repeated 10000 times. Different variances in Raman band position are also tested to systematically show the sensitivity. Calculated stresses are extremely sensitive to small standard deviations on measured Raman frequencies. Anti-correlation increases as the standard deviation on the 206 cm^{-1} peak gets higher (top row), as seen in Figs. 5c and 6c for actual measurements on experimental and natural inclusions. Assuming conservative values of standard deviation of 1 cm^{-1} on the 206 cm^{-1} peak, and of 0.5 cm^{-1} on the other peaks (top right diagram), absolute differences between the two values of σ higher than $\sim 1\text{GPa}$ are deemed unlikely and such values are rejected from the analysis.