Observed rapid bedrock uplift in Amundsen Sea Embayment promotes ice-sheet stability

The marine portion of the West Antarctic Ice Sheet (WAIS) in the Amundsen Sea Embayment (ASE) accounts for one-fourth of the cryospheric contribution to global sea-level rise and is vulnerable to catastrophic collapse. The bedrock response to ice mass loss, glacial isostatic adjustment (GIA), was thought to occur on a time scale of 10,000 years. We used new GPS measurements, which show a rapid (41 millimeters per year) uplift of the ASE, to estimate the viscosity of the mantle underneath. We found a much lower viscosity ($4 \times 10^{18}$ pascal-second) than global average, and this shortens the GIA response time scale from tens to hundreds of years. Our finding requires an upward revision of ice mass loss from gravity data of 10% and increases the potential stability of the WAIS against catastrophic collapse.