Full Stokes simulations of the drainage system from Dome Fuji to Shirase Glacier, Antarctica

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The Shirase Glacier drains a large area of the East Antarctic ice sheet, influencing dynamics upstream to Dome Fuji. At its narrow outlet region flow speeds of up to 2.5 km/year occur, leading to large lateral shear. This, and the deviation from shallowness imposed by the geometry of the summit area of Dome Fuji, gives motivation to investigate the dynamics using the Full Stokes (FS) model, Elmer/Ice.
This paper focuses on the basic set-up of the case. In particular, issues concerning the computing-mesh generation, which must account for the different flow regimes as well as side boundaries cutting through the ice sheet, will be discussed. Furthermore, the relative contributions of slow and fast ice flow to the global/local mass balance as well as the influence of basal sliding will be investigated.