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New modeling of the Vostok ice flow line and implication for the glaciological chronology of the Vostok ice core

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We have used new spaceborne (elevation) and airborne (ice thickness) data to constrain a 2D1/2 model of snow accumulation and ice flow along the Ridge B-Vostok station ice flow line (East Antarctica). We show that new evaluations of the ice flow line geometry (from the surface elevation), ice thickness (from low-frequency radar data), and basal melting and sliding significantly change the chronology of the Vostok ice core. This new Vostok dating model reconciles orbital and glaciological timescales and is in better agreement with the Dome Fuji and Dome C glaciological timescales. At the same time, the new model shows significantly older ages than the previous GT4 timescale for the last glacial part, being thus in better agreement with the GRIP and GISP2 chronologies. Moreover, we study the influence of various parameters on the chronology of an ice core not situated on a dome, like the Vostok ice core.