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Testing the subduction configuration that built the Paleogene Taurides fold-thrust belt

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Anatolia contains the accreted remnants of a subducted continental fragment known as the Anatolide-Tauride block. The block accreted below oceanic lithosphere preserved as ophiolites, in a southward propagating nappe stack.
The most southerly part of the block accreted in the Paleogene, as a thin-skinned non-metamorphic fold-thrust belt known as the Taurides.

Evidence from paleomagnetic data and structural data suggests that the Anatolian subduction zone which accreted the Anatolide-Tauride block contained east-west and north-south trending trench segments (Lefebvre et al., 2013; Gürer et al., 2016; van Hinsbergen et al., 2016). The central Anatolian north-south trending segment appears to have developed a foreland propagating fold-thrust belt that culminated in the accretion of the northwest-southeast striking Central Tauride fold-thrust belt.

Paleomagnetic data from the fold-thrust belt, however, have been used to argue that it underwent a 40 degree clockwise block rotation between Eocene and Miocene time (Kissel et al., 1993; Meijers et al., 2011). This would restore the block (or at least the thrusts that deformed the block) to an east-west trend prior to accretion. How and where these rotations were accommodated, and what these mean for the orientation and evolution of Central and West-Anatolian trenches in the Cretaceous and Paleocene remains enigmatic.

We use balanced cross sections, new paleomagnetic data, and fault kinematic data to identify the Eocene age rotation pole of the Central Taurides relative to Central Anatolia. We then restore the Eocene age trench configuration. We test whether the modern shape of the Taurides fold-thrust belt was caused by subduction and rotation into a north-south trending trench.