The case for a distributed solar dynamo shaped by near-surface shear

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Arguments for and against the widely accepted picture of a solar dynamo being seated in the tachocline are reviewed and alternative ideas concerning dynamos operating in the bulk of the convection zone, or perhaps even in the near-surface shear layer, are discussed. Based on the angular velocities of magnetic tracers it is argued that the observations are compatible with a distributed dynamo that may be strongly shaped by the near-surface shear layer. Direct simulations of dynamo action in a slab with turbulence and shear are presented to discuss filling factor and tilt angles of bipolar regions in such a model.