High-resolution dynamical modelling of the Antarctic stratospheric vortex.

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Progress is reported on the high-resolution three-dimensional numerical simulation of flows characteristic of the Antarctic wintertime stratosphere. The numerical model is a modified version of the Reading University sigma-coordinate spectral model, used previously for tropospheric studies. Physical parametrizations are kept to a minimum in order to concentrate as much computing power as possible on simulating details of the dynamical processes. The major question addressed is whether the features observed in recent high-resolution two-dimensional simulations - namely (i) the formation of a sharp edge to the vortex (seen in the potential vorticity field), (ii) the survival of the polar vortex in a material entity, and (iii) the formation of small-scale eddies rough the break-up of tongues of high potential vorticity drawn out from the polar vortex - are realised in three-dimensional simulations.