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# Tracking of small-scale convective cells in 3D

Birgit Lemmerer (1), Arnold Hanslmeier (1), Herbert Muthsam (2), and Isabell Piantschitsch (1)
(1) Institute of Physics, University of Graz, Austria, (2) Faculty of Mathematics, University of Vienna, Austria

High resolution solar observations and simulations indicate the existence of a subpopulation of granular cells that are smaller than 600 km. How they form and dissipate is still unclear. Simulations suggest that small granules may not result from fragmentation of larger granular cells but instead evolve and dissolve in regions of intergranular lanes, rarely merging with other granules. In this study we investigate the formation and dynamics of these granular cells in three dimensions. We present newly developed algorithms that identify and track their evolution from the point of appearance to their dissolution. The algorithms were applied to data from observations and 3D numeric simulations. We investigate the structural variation of granules in 3D and their interaction with the surrounding convective cells, vortex motion and magnetic flux tubes, and study their 3D evolution and topology in the convection zone. We show that the dynamics of small granules are strongly influenced by horizontal vortex motions rather than strong magnetic fields and that their 3D shapes are mainly governed by surrounding strong downflows.