

DAVE-DAVE4VM archive

The DAVE-DAVE4VM archive are optical flow methods for estimating velocities from a sequence of images. The differential affine velocity estimator (DAVE) models image motion with either the continuity equation or the convection equation (depending on a switch). The differential affine velocity estimator for vector magnetograms (DAVE4VM) models motion of a vector of images (B_x, B_y, B_z) with the ideal magnetic induction equation. Both codes assume the data has been projected into a Cartesian coordinate system and apply an affine velocity profile in a windowed subregion. The original version of this archive can be found at ApJ.

P.W. Schuck, Tracking Vector Magnetograms with the Magnetic Induction Equation, ApJ 683 1134-1152, 2008 doi: 10.1086/589434

Other papers of interest are:

B. T. Welsch, et al, What is the Relationship Between Photospheric Flow Fields and Solar Flares?, ApJ, 705, 821-843, 2009, doi: 10.1088/0004-637X/705/1/821

B. T. Welsch et al, Tests and Comparisons of Velocity-Inversion Techniques, ApJ, 670, 1434-1452, 2007, doi: 10.1086/522422

P. W. Schuck, Tracking Magnetic Footpoints with the Magnetic Induction Equation, ApJ 646 1358-1391, 2006, doi: 10.1086/505015

P. W. Schuck, Local Correlation Tracking and the Magnetic Induction Equation, ApJ, 632, L53-L56, 2005, doi: 10.1086/497633

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