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Rapid Evolution of Small-Scale Flows in Solar Granulation RILEY HEIMAN, University of Wisconsin - Green Bay — We used local correlation tracking to estimate horizontal velocities in an image sequence of convection at the solar photosphere, at high spatial and temporal resolution (0.034" pixels and 10-second cadence, respectively) observed in TiO (705.7 nm) with the Goode Solar Telescope. A key goal of our study was to estimate the lifetimes of flows in granules, which have implications for models of coronal heating that rely upon rapid evolution in photospheric forcing of coronal magnetic field evolution. We estimate flow lifetimes by fitting the decorrelation times of flow maps. For LCT apodization windows near 200 km (8 pixels), we find flow lifetimes of about 60 sec. On these scales, we also find flow speeds consistent with previous reports, of order a few km/sec. With the LCT apodization window set to 100 km (4 pixels), we found flows to be faster and shorter-lived. The observed flow evolution is therefore rapid enough to excite turbulent interaction between upward- and downward-propagating Alfvén waves between the photosphere and corona, consistent with the predictions of a coronal heating model proposed by van Ballegooijen et al. (2011).

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