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Emergence of vertical magnetic fields in quiet Sun granules: statistical properties

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Abstract. The emergence of apparently unipolar, vertical fields in granules has been observed in greater details with the spectropolarimeter aboard the Hinode satellite. This emergence seems to carry vertical magnetic fields from the subsurface layers to the photosphere and clearly differs from the emergence of small magnetic loops in granular convection. We analyze a total of 13 events detected in 10 hours of high-cadence time series of spectropolarimetric measurements in quiet solar regions near disk center and show some statistical properties. The average lifetime of these emergence processes is of the order of 15 minutes. They bring magnetic fluxes of about 30 Mx cm^{-2} comparable to typical IN magnetic concentrations. All the events show strong upflows of some 2.5 km s^{-1} during the early phase of the emergence. We do not find any evidence for linear polarization signals associated with these events or significant response in the chromosphere.