

The role of magnetic field on the scale of solar surface convection

IJIMA, Haruhisa^{1*}, YOKOYAMA Takaaki¹

¹Department of Earth and Planetary Science, University of Tokyo

We are investigating the magnetoconvective effect on the solar surface convection.

The solar surface velocity spectrum has two peaks at the scales of granulation and supergranulation. Supergranulation has strong magnetic field at its boundary, so it is important for the heating of upper atmosphere.

Supergranulation was first discovered in 1950s. Since then, the origin of supergranulation has been an open question. Traditionally, it is believed that the recombination of helium is the main driver. But the recent study reports that there does NOT appear a supergranular peak in the state-of-art numerical simulation including the effect of partial ionization.

Crouch et al. (2007) suggest the magnetoconvective origin of supergranulation.

The aim of our study is to confirm Crouch's scenario with realistic radiative magnetoconvection simulations.

No supergranular peak was found in our non-magnetic hydrodynamical simulation. This result is consistent with previous studies.

We will report the result with magnetic field and discuss the role of magnetic field on the creation process of supergranulation.

Keywords: sun, photosphere, convection, magnetic field