

**M01a      The properties of the Ca II/G-band bright points around the penumbra**

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Due to the very high spatial resolution and the continuous observation of SOT/Hinode, we found that the Ca II bright points penetrated to the west edge of the penumbra of the NOAA10923 preceding spot on 15 November, 2006. The velocity of the penetrated bright points is  $\sim 0.6$  km/s and is similar to the transverse velocity of the super granule. It suggests that the moat region does not exist in the early phase of sunspot. Two days after, the bright points still penetrated to the penumbra. But, we found that a part of MMFs expands to outer of the penumbra. After one rotation, the sunspot definitely showed the moat region at the west of the penumbra. The observation shows that the moat region is forming while interacting between the sunspot, super granules and network magnetic field. In order to study the interaction, we investigate the motion and magnetic field of bright points using SOT-FG/SP and XRT data. At result, we found following facts: 1) The penetrated Ca II bright has the counter bright points in G-band image. 2) The Ca/G-band bright points disappear during moving to the penumbra edge. 3) The magnetic field strength of the penetrated bright points is about 1300 gauss. And the magnetic field is vertical, is not similar to that of the penumbra. 4) Between the edge of penumbra and the network magnetic field, there are relatively bright X-ray loops. From the results, we discuss the relationship between the sunspot decaying, the super granule and the network magnetic field.