

Photospheric magnetic fields associated with filament barbs

Jung-Hoon Kim¹, Hong Sik Yun¹, Jongchul Chae², Sangwoo Lee¹

¹*Astronomy program, SEES, SNU*

²*Department of Astronomy & Space Science, CNU*

The magnetic structure of solar filaments are studied for a long time. But still we do not know it in detail. In this study, We have tried to test 2 filament models by observing its barbs. Martin's wire model (Sol. Phy. 182, 107, 1998) predicts that the end of filament barbs should rooted at minor polarities in filament channel, while Aulanier's magnetic dip model (A&A, 329, 1125, 1998) shows that the end of barbs will be located along the polarity reversal line of minor fluxes in filament channel. With these two models in mind, we have investigated the filaments barbs and associated photospheric magnetic poles to determine which of these models are more realistic.

The photospheric longitudinal magnetograms are selected from SOHO, MDI archives. The locations of filament barbs on the MDI magnetogram are determined by aligning the full disk H-alpha images taken at Big Bear Solar Observatory. In this study, we have selected large quiescent filaments with well-developed barbs. The preliminary result shows that photospheric cancelling magnetic features (CMFs) are closely related to the filament barbs. We have found, at the end of filament barbs, there exist a small bipole which shows flux cancellation with time. Our result does not support two filament models we have investigated. The possible magnetic structures of filament barbs and its roles related to photospheric magnetic fields are discussed.