
Morphological Study on a Quiescent Filament and Related Magnetic Fields

Sang Woo Lee¹, Hong Sik Yun¹ and Jongchul Chae²

¹ Department of Astronomy, Seoul National University, Seoul

² Big Bear Solar Observatory, New Jersey Institute of Technology,
40386 North Shore Lane, Big Bear City, CA 92314-9672

In the present study, we have analyzed two-dimensional H-alpha spectrum data of a quiescent filament as well as time sequences of H-alpha filtergram and magnetogram data. The present observation was performed for 4 successive days from July 23 to 26, 1999 at Big Bear Solar Observatory to investigate morphological evolution of a quiescent filament. Two-dimensional spectral data have been obtained by drifting the telescope for about 10 seconds, every 30~60 minutes for each whole day. Between spectral scannings H-alpha images and magnetograms have been taken continuously.

The two-dimensional spectrum data allow us to generate spectroheliograms for any wavelength near H-alpha, which are utilized to generate Dopplergrams of the quiescent filament. The generated Dopplergrams have revealed a variety of global motions on a filament body itself, which are readily identified in H-alpha movies made from H-alpha filtergram images. These motions seem to correspond the so-called streamings and counterstreamings(Martin 1998), which play a key role in maintenance of a filament structure. Morphological variations of the filament spine and barbs are examined and their association with magnetic fields is discussed.