

# **Magnetic properties within sunspot clusters**

**Jing Li** (1), Juan Guo (2), Hongqi Zhang (2)

(1) Institute for Astronomy, University of Hawaii, 2680 Woodlawn Drive, Honolulu, HI 96822, USA, (2) National Astronomical Observatories, Chinese Academy of Science, Beijing, 100012, China

By studying coronal limb synoptic maps, we found that the long-lived, large scale coronal streamers are sustained by spatially related non-contemporaneous sunspots. The individual sunspot group normally has life time of one solar rotation. But different groups of sunspots emerge from the same location on the sun give rise to the streamers which can last as long as 10 solar rotations. This finding accounts for earlier studies on "active longitudes", "sunspot nests" or "active zones". The implication of these studies is that there exists a subsurface source of activity which lasts sometimes for years. Continuous line-of-sight magnetograms are obtained by MDI/SOHO since 1996. These data provide opportunities to study magnetic structures of sunspots as function of time. We will present 5 sunspot clusters selected by coronal streamers over years 1996 to 2002. Each sunspot group within the 5 clusters are studied with "structural parameters" including distances between virtual positive and negative polarities, areas, magnetic flux, magnetic tilt angles using MDI data. These parameters have been studied recently with different types of sunspots.