

Proposal Abstract:

Spatial coincidences between radio polarized intensity structures and HI filaments have been found recently, indicating alignment of the magnetic field in the ionized and neutral medium in some HI structures. However, these associations are sparse, and the role that the regular magnetic field plays in confining the magnetized ionized and neutral ISM together is unclear. We propose a supplementary FAST observation of the large-scale polarization bubble G164+2.5 using the 19-beam receiver. It is coincident with the large-scale HI shell at -20 km/s. Part of its end covers in the SNR G166.0+4.3 region, and the derived RM is about 55 rad m⁻². Faraday screen modeling showed that it had a distance of about 2.2-2.6 kpc, with enhanced LOS B of at least 6 μ G. By comparing with the Planck 353 GHz dust starlight data, we will study the alignment of the magnetic field between the HI shell and the polarization bubble, and investigate the relative equilibrium between the magnetic energy and the thermal gas pressure.