

A multi-wavelength study of the merger candidate Abell S0721 and the activities of its member galaxies

P.-L. Ho (1,2) and L.-W. Chen (1)

(1) Department of Earth Sciences, National Taiwan Normal University, Taipei, Taiwan, China

(2) Astronomical Observatory, Central Weather Bureau, Ministry of Transportation and Communications, Taipei, Taiwan, China

We present a multi-wavelength study of the merging history and its influence on galaxy activities of a newly detected merger candidate - Abell S0721. This cluster was only known as a poor cluster in the Shapley Supercluster, but when several survey data of different wavelengths are combined, evidence of strong merging is revealed. We have analyzed the optical and X-ray structures of the cluster, as well as galaxy dynamics and properties of the radio galaxies in the cluster. The dynamics analysis shows the velocity distribution of this system is significantly deviated from one Gaussian model, indicating existence of 2-3 dynamically different sub-systems; in addition, the optical and X-ray structures both show an elongated and multi-clumps structure, two X-ray clumps imaged by ROSAT All Sky Survey are well related to two galaxy density peaks (based on MAMA digitized catalogue from Paris Observatory). Finally, the radio galaxies identified in Abell S0721 are all optically luminous, as compared with other merger candidates in the Shapley Supercluster, the fraction of bright radio galaxies is only lower than one merger candidate, this suggests Abell S0721 is also at the beginning of a merger event. The cluster is possibly a merger of several groups; the main two merging groups might be seen at near the projection plane and a few tenth Gyr around the core passage. The merging process could also be an origin to boost the activities of its member galaxies.