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## Probing Gas Sloshing in the Core of Galaxy Cluster ZwCl 3146: Insights from Chandra and GMRT Observations

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We present an analysis of the X-ray bright galaxy cluster ZwCl 3146 (redshift  $z = 0.291$ ) using archival 90 ks Chandra observations, along with our 1.4 GHz GMRT observations. Beta model subtracted residual and unsharp X-ray images reveal spiral-like features within the central 230 kpc, indicative of gas sloshing in the intracluster medium (ICM). We also detect an offset of about 11 kpc between the brightest cluster galaxy (BCG) and the X-ray peak, as well as signs of interaction between the BCG and a substructure in the cluster core. These features suggest that the observed sloshing was triggered by a minor merger event. Furthermore, we identify three sharp surface brightness edges to the North-East, South-East, and South-West of the X-ray peak, located at projected distances of 232 kpc, 172 kpc and 119 kpc, respectively. X-ray spectral analysis across these edges reveals temperature jumps, accompanied by electron density discontinuities with an average density compression factor  $C = 1.46$ . The pressure profiles remain continuous across these edges, consistent with their interpretation as cold fronts generated by gas sloshing. The GMRT 1.4 GHz image reveals the presence of a central radio source, along with diffuse radio emission co-spatial with the central spiral structure. The radio emission partially fills some of the previously reported X-ray cavities.

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None

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Yes, I ACCEPT

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