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## The Chemical and Thermal Structure of the Atmosphere of the Elliptical Galaxy NGC 5813

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We present a robust representation of the galaxy group NGC 5813's chemical and thermal structure analysing archival, deep X-ray observations of the group using up to date atomic line emission models and multi temperature spectral model. The selection of our target is motivated by the fact that NGC 5813 has a very relaxed morphology, making it a promising candidate for the study of the AGN feedback's influence in the intra-group medium (IGrM). Our results showcase a prominent, extended distribution of cold gas along the group's NE-SW direction, correlating with the direction along which the supermassive black hole in the group's central galaxy is known to interact with the IGrM. Our analysis indicates gas being uplifted from the group's centre as the probable origin of the cold gas distribution, although alternative scenarios, such as in-situ cooling can not be explicitly ruled out. Regarding the chemical structure of the IGrM, we find no evidence of an AGN feedback induced chemical enrichment, with the elemental abundance remaining Solar on average across the group. The distribution of elements appears to be independent of galactocentric radius, azimuth and the thermodynamics of the gas, suggesting that the IGrM has been efficiently mixed. The large scale uniformity of the abundance distribution implies the presence of complex dynamical processes in NGC 5813, despite its overall relaxed morphology, with possible indications of sloshing and turbulence as the primary mechanisms behind it.

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