



Radio continuum emission and HI gas accretion in the NGC 5903/5898 compact group of early-type galaxies

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Abstract. The paper presents new connections found between the radio continuum and HI emission associated with the nearby compact group of early-type galaxies NGC 5903/5898.

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1. Results

We discuss the nature of the multi-component radio continuum and HI emission associated with the nearby galaxy group comprised of two dominant ellipticals, NGC 5898 and NGC 5903 and a dwarf lenticular ESO514–G003 (Maia et al. 1989). Striking new details of radio emission are unveiled from the 2nd Data Release of the ongoing TIFR.GMRT.SKY.SURVEY (TGSS) which provides images with a resolution of $\sim 24'' \times 18''$ and a typical rms noise of 5 mJy at 150 MHz¹. Previous radio observations of this compact triplet of galaxies include images at higher frequencies of the radio continuum as well as HI emission, the latter revealing huge HI trails originating from the vicinity of NGC 5903 where HI is in a kinematically disturbed state (Appleton et al. 1990 also, Gopal-Krishna 1978). The TGSS 150 MHz image has revealed a large asymmetric radio halo around NGC 5903 and also established that the dwarf SO galaxy ESO514–G003 is the host to a previously known bright double radio source

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¹<http://tgss.tifr.res.in/>

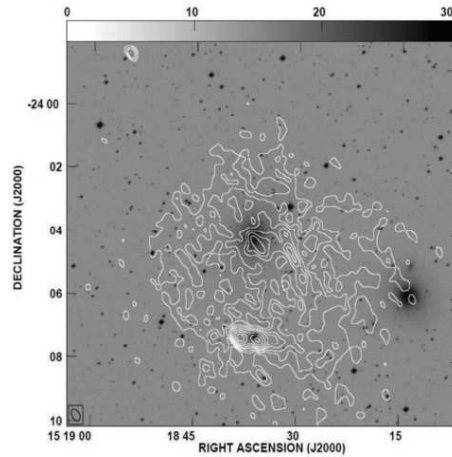


Figure 1. Contours of 150 MHz (TGSS) radio continuum emission overlaid on optical DSS image (R-band) of the galaxy triplet, showing NGC 5898 to the west, NGC 5903 to the The radio emission from NGC 5903 is found to have a very steep spectrum ($\alpha \sim -1.5$) and to envelope a network of radio continuum Fig.2 north and ESO 514-G003 to the south. The FWHM of the synthesized radio beam is plotted in the lower left corner. The contour levels are: 2,3,4,6,8,11,16,23,31,44 (in units of 7.17 mJy/beam).

(Figure 1). The radio emission from NGC 5903 is found to have a very steep radio spectrum ($\alpha \sim -1.5$ between 150 MHz and 1.4 GHz) and to envelope a network of radio continuum filaments bearing a spatial relationship to the HI trails (see Gopal-Krishna et al. 2012). Another noteworthy aspect of this triplet of early-type galaxies highlighted by the present study is that both its radio loud members, namely NGC 5903 and ESO514-G003, are also the only galaxies that are seen to be connected to an HI filament. This correlation is consistent with the premise that cold gas accretion is of prime importance for triggering powerful jet activity in the nuclei of early-type galaxies. Details of this study are provided in Gopal-Krishna et al (2012).

References

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