

## PRECESSING JETS IN 2300-189

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The radio source 2300-189 is a 17 mag QSO with  $z = 0.1287$ . There is a companion galaxy with the same redshift, 6.8 arcsec distant at P.A.  $299^\circ$ . The main object is classified as a QSO rather than an N-galaxy on the basis of its stellar appearance with a small amount of surrounding fuzz on a CTIO 4m IIIaF plate obtained by H. Spinrad. The spectrum obtained at the AAT is also typical of a QSO. Stellar absorption features as well as narrow emission lines are detected in the fuzz, indicating the occurrence of a QSO in a galaxy of stars.

Radio maps obtained with the VLA (by JJC) show extensive structure over almost 0.5 Mpc (for  $H_0 = 100 \text{ km s}^{-1} \text{ Mpc}^{-1}$ ). This structure which is centred on the QSO shows very clear inversion symmetry at 1465 MHz. Inversion symmetry on this scale is readily explained as radiation from oppositely directed jets, whose axis is steadily precessing. The northern jet is stronger and contains several strong condensations which are also seen at 4885 MHz. At this frequency the jet appears one-sided.

From the ellipticity of the structure, the angle to the line of sight is found to be  $69 \pm 5^\circ$ . The half-cone angle of the precession is  $71 \pm 5^\circ$ . From the overall geometrical symmetry of the two jets, it may be inferred that the velocity of the plasmoids in the jets must be small ( $v \leq 0.2c$ ).

The companion object occurs at a projected separation of 11 kpc and a probable true separation of 30 kpc. The existence of a nearby companion object appears to be a common feature of radio sources with inversion symmetric structure suggestive of precessing jets.

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