ROSAT SELECTED INTERACTING GALAXIES WITH NARROW EMISSION LINES

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In the context of an identification program of sources from the ROSAT All-Sky Survey (RASS) on Schmidt objective prism plates (Bade et al. 1992a,b) we discovered two galaxy pairs, which contain a narrow-line Seyfert 1 component with an X–ray luminosity of $L_x \sim 10^{44}$ erg s^{-1} and an HII–region galaxy. Apparently they are interacting. Their redshifts are $0.1 < z < 0.3$ and their brightnesses $17.5 < B < 19.5$. A third one was found among EINSTEIN sources. Typical separations between the components are 10". Near the pairs other galaxies were found, and although their physical association is not confirmed spectroscopically it is quite probable that they form a small cluster of galaxies. ROSAT HRI observations indicate that the X–ray emission is not extended and originate from the AGN alone. It is remarkable that the AGN in all physical pairs identified so far have rather narrow permitted emission lines with linewidths ≤ 1500 km s^{-1}.

Optically selected galaxies in interacting systems show enhanced nuclear activity compared to isolated galaxies. Interaction between galaxies is thought therefore to be an important process leading to the formation of an active galactic nucleus (Fricke & Kollatschny 1989). It was proposed that ultraluminous IRAS galaxies with bolometric luminosities similar to QSO's may form the beginning of the evolutionary sequence leading to ordinary QSO's. They are to a high degree interacting systems (Sanders et al. 1988).

The credibility of this evolutionary scenario would be strengthened considerably if transition objects could be found. We speculate that our X–ray selected interacting galaxies may be in such an intermediate state: An accretion disc responsible for the X–ray emission has already formed, while the obscuring dust has dissipated so far that the X–ray emission can leave the center of the AGN unhindered. The narrowness of the permitted emission lines leads to the assumption that their width is evolving with age. The broad-line region responsible for the optical emission of the presumed transition objects has then not reached the full velocity dispersion observed in ordinary AGN.

Bade N., Dahlem M., Engels D., et al., 1992a, MPE-Report 235, 377
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Fricke K.J., Kollatschny W., 1989, IAU Symposium 134, p. 425
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