Abstract Submitted
for the APR12 Meeting of
The American Physical Society

Modeling and Classifying X-Shaped Radio Galaxies JULIAN STARR, ROBERT SOBCZAK, PAUL WIITA, The College of New Jersey — While there are several explanations for the formation of the apparently modest subset of radio galaxies that display an X-shaped morphology (XRGs), an important but often overlooked aspect of observing XRGs is the classification uncertainties arising from projection effects. These XRGs have hot-spots in one set of primary lobes, as is typical for powerful RGs, but also have a greatly offset pair of secondary lobes that lack hot-spots. To determine the likelihood of a true XRG appearing non-X-shaped, we developed a computer algorithm to model fiducial XRGs and then rotated the models by random angles so as to develop probabilities that observations would lead to classification errors due to projection effects. We show that XRGs may be misclassified as showing Z-shaped, winged, standard double, and double-double morphologies. A "perfect" XRG, that is, one with perpendicular, equal-sized primary and secondary lobes, may appear as having a different morphology $\sim$20% of the time. Thus many true XRG sources can be misclassified, significantly affecting the number that are known to exist. The double-double RGs are very rare and usually are interpreted as manifestations of restarted jet activity; however, a substantial fraction of them may really be XRGs viewed at special angles.

Julian Starr
The College of New Jersey

Date submitted: 05 Jan 2012 Electronic form version 1.4