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Powerful radio galaxies and quasars exhibit significant side-to-side asymmetries on many-kiloparsec scales. It is important to understand whether any, or all, of these asymmetries can be explained by coupling the relativistic-jet models that are required to explain parsec-scale phenomena in such objects with the orientation-dependence suggested by optical spectropolarimetry and apparent emission-line anisotropies. Two studies will be made to test different aspects of this unification.

First, an analysis of the relative prominence of jet and counterjet features in samples of radio galaxies and quasars will be extended to include central (mas-scale) features and hot spots. Preliminary work on such prominence statistics shows (a) that the prominence of straight kiloparsec-scale jet segments correlates well with the prominence of mas-scale features, but not with the slope expected if the jets reach kiloparsec scales with typical Lorentz factors as high as those on parsec scales, and (b) that increased bending of jets both increases the detectability of counterjets and decreases the prominence of hot spots. These results suggest that initially relativistic jets in radio galaxies and quasars decelerate significantly on the scales that we image with the VLA, and will be tested using larger source samples.

Second, the spectral index asymmetries of a sample of powerful radio galaxies and quasars will be imaged using the VLA and MERLIN. In sources without prominent jets, the shorter arm of the radio source usually exhibits greater depolarization and a steeper radio spectrum (as well as brighter optical emission lines). By contrast, in sources with prominent jets, the depolarization asymmetry correlates not with arm length but with the jet brightness asymmetry -- the lobe fed by the brighter jet shows less Faraday depolarization than the other, regardless of arm length. This effect is frequently cited as evidence for the orientation bias required by the standard relativistic-jet models of quasar asymmetries. Low-resolution studies of the spectral index asymmetry have recently claimed that it too is governed by the jet brightness asymmetry in sources with prominent jets. This claim is problematic because, unlike the depolarization (which can depend on orientation via the geometry of the lines of sight to the lobes through an intervening medium), the spectral index is intrinsic to the emitting regions and so should not depend on orientation. It is important to examine the spectral index asymmetry of the most extended lobe emission at higher resolution to avoid contamination by potentially beamed components of the sources. The relationships between spectral asymmetries, arm length, jet sidedness, and depolarization may then become an important testing-ground for models of all of them.

High-resolution VLA imaging and polarimetry of the filamentary lobes of the radio galaxy 3C353 will continue. This study will show whether the many-kiloparsec-scale filaments throughout the lobes of a moderately-powerful radio galaxy are systematically distinguished from other emission by spectral index, spectral curvature (ageing), or degree of polarization. Models for the origin and evolution of large-scale filamentation in radio sources presently encounter very few observational constraints. The mechanism for the filamentation is therefore unclear, though its consequences for source energetics and confinement may be considerable.

Systematic studies of powerful extragalactic radio sources suffer from the lack of a high-quality digital database with well-resolved images of a representative sample of such sources. A digital "Atlas" containing VLA, MERLIN and WSRT imaging of a complete sample of nearby 3CR sources will be completed by new MERLIN and WSRT observations of the sample's most compact and most extended members. This Atlas will then be made available to the astronomical community.