# From the Blazar Sequence to the Blazar Envelope: Revisiting the Relativistic Jet Dichotomy in Radio-loud AGN

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We revisit the concept of a blazar sequence that relates the synchrotron peak frequency ({\nu}peak) in blazars with synchrotron peak luminosity (Lpeak, in {\nu}L{\nu}) using a large sample of radio-loud AGN. We present observational evidence that the blazar sequence is formed from two populations in the synchrotron {\nu}peak - Lpeak plane, each forming an upper edge to an envelope of progressively misaligned blazars, and connecting to an adjacent group of radio galaxies having jets viewed at much larger angles to the line of sight. When binned by jet kinetic power (Lkin; as measured through a scaling relationship with extended radio power), we find that radio core dominance decreases with decreasing synchrotron Lpeak, revealing that sources in the envelope are generally more misaligned. We find population-based evidence of velocity gradients in jets at low kinetic powers (~ 10^42-10^44.5 erg/s), corresponding to FR I radio galaxies and most BL Lacs. These low jet power 'weak jet' sources, thought to exhibit radiatively inefficient accretion, are distinguished from the population of non-decelerating, low synchrotron-peaking (LSP) blazars and FR II radio galaxies ('strong' jets) which are thought to exhibit radiatively efficient accretion. The two-population interpretation explains the apparent contradiction of the existence of highly core-dominated, low-power blazars at both low and high synchrotron peak frequencies, and further implies that most intermediate synchrotron peak (ISP) sources are not intermediate in intrinsic jet power between LSP and high synchrotron-peaking (HSP) sources, but are more misaligned versions of HSP sources with similar jet powers.

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