

Bias of core shift effect measurement in the blazars jets

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The inhomogeneous model of a blazar jet predicts a shift of its apparent base with observations frequency. Measurements of this effect provide an important information about the physical conditions and structure of the innermost jet regions.

We propose methods to account for the systematic errors specific to the core shift measurement approach based on a cross-correlation of multifrequency VLBI images. We also estimate the bias of a core shift estimation due to approximating the real source structure with a simple model represented by a gaussian templates. We use the artificial data sets created using real VLBI data and inhomogeneous jet model evaluated on a grid of the parameters obtained from the simulation of the flux-limited sample. We found that the core shifts are typically overestimated by a factor of few. Thus, the magnetic field strength inferred from these measurements is also overestimated. We consider the influence of this bias on deriving various jet parameters and discuss the possibility to account for the bias using the observed data at hand.