EUROPEAN NETWORK
14th EVN Symposium & Users Meeting
Granada, October 8-11 2018

Solving the puzzling kinematics of flat spectrum radio quasar 1928+738

Kunwoo Lee, Jongho Park, Sascha Trippe

A recent study has discovered a fundamental relation between the long-term (Doppler-corrected) variability timescales of radio-loud AGN at cm wavelengths and the accretion rate. However, one source, 1928+738, out of ≈ 40 sources is substantially deviated from the relation. This might be because there is an ambiguity in Doppler factor of this source in the literature: the values from two different studies are different by more than a factor of 3 even though their methodology are quite similar to each other. We extracted the recent 15 GHz VLBA data (MOJAVE monitoring program) to obtain the Doppler factor by an independent method. Interestingly, we obtained increasing apparent velocities and increasing Doppler factors as function of distance from core, which indicates that bending of the jet toward our line of sight might contribute to the quite complicated kinematics for this source; the jet viewing angles decrease from ≈ 30 to ≈ 0 degrees. However, it seems that the assumption we used for estimating the Doppler factor does not hold at 15 GHz due to relatively long radiative cooling timescales since the bending of jet by almost 30 degrees is quite unrealistic. Therefore we have monitored 1928+738 ≈ 2 years with KaVA at 43 GHz. We aim to investigate (i) the accurate value of the Doppler factor of 1928+738 to confirm that whether this source is an outlier in the relation between variability timescale and accretion rate or not and (ii) whether the increasing apparent velocity as a function of distance from the core is related to jet bending toward our line of sight or not. Here we present our preliminary results.