

Title: Origin of the mm emission in Radio Quiet AGNs

Authors: Petrucci, Pierre-olivier (speaker); Pietu, Vincent; Behar, Ehud; Clavel, Maica; Bianchi, Stefano; Henri, Gilles; Barnier, Samuel; Chen, Sina; Ferreira, Jonathan; Malzac, Julien; Belmont, Renaud; Corbel, Stephane; Coriat, Mickael

Abstract: The physical origin of the radio emission of Radio Quiet (RQ) AGN remains broadly unclear. The observation of flat and inverted radio spectra at gigahertz frequencies seems to support, however, the presence of an unresolved synchrotron self-absorbed region in the close environment of the supermassive black hole. Its size could be as small as that of the X-ray corona. We will present in this talk the results of simultaneous mm-X-ray observation of a sample of RQ AGN by NOEMA and XMM or NuSTAR. We will focus on the case of MCG+08-11-11 for which the mm and X-ray flux show both clear increase along the pointing. A structure function analysis shows a local maximum in the mm light curve corresponding to 2-3% of variability on a timescale of $\sim 2 \times 10^4$ s (100-300 R_g light crossing time). Assuming an optically thick mm emitting medium, this translates into an upper limit of its size of ~ 1300 R_g. Such small size of the mm emitting region in RQ AGN is supported by fast (hour) variability observed in other objects of the sample. These observations thoroughly support the idea that the mm emission in RQ AGN is emitted by a region close to, and potentially related to, the X-ray corona such as an outflow or weak jet.