Effelsberg Monitoring of AGN Jets with VHE Astroparticle Emissions

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What is the TELAMON program?

The TELAMON program is using the Effelsberg 100-m telescope to monitor the radio spectra of active galactic nuclei (AGN) under scrutiny in astroparticle physics, namely **TeV blazars and candidate neutrino-associated AGN**. We perform high-frequency observations every 2-4 weeks at multiple frequencies up to 44 GHz. We aim to characterize the radio variability of very-high energy emitting AGN jets and trace dynamical processes in the pc-scale jets of blazars related to high-energy flares or neutrino detections. Our sample covers about 40 sources and is dominated by high synchrotron peaked objects.

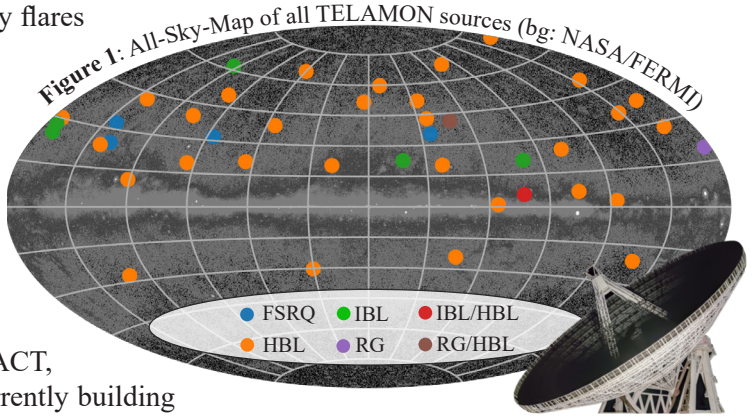

Figure 1: All-Sky-Map of all TELAMON sources (bg: NASA/FERMI)

What is unique about TELAMON?

The large Effelsberg dish can yield superior radio data over other programs for very-high-energy (VHE) emitting blazars, which are often faint radio sources. Moreover, we are coordinating our observations with FERMI-LAT, FACT, H.E.S.S. and VERITAS AGN monitoring groups. We are currently building a unique sample of TeV- and neutrino-associated AGN, excluding bright low-peaked blazars, which are well covered in other monitoring programs. As a selection criterion, we include all sources whose low-state flux density falls below 500 mJy. Sources south of 30° are also observed by ATCA. This leads to a sample that is complete (down to 10-20 mJy) for HBLs. The TELAMON target list is dynamically updated with new neutrino detections.

Example Source: S2 0109+22

For each monitored source, we derive continuous dynamic spectra and light curves. Figure 2 shows as an example the source S2 0109+22 which exhibits flaring activity with a continuous increase in flux density over about 100 days both at 14mm and 7mm. Our sampling rate is well suited to sufficiently resolve such time scales.

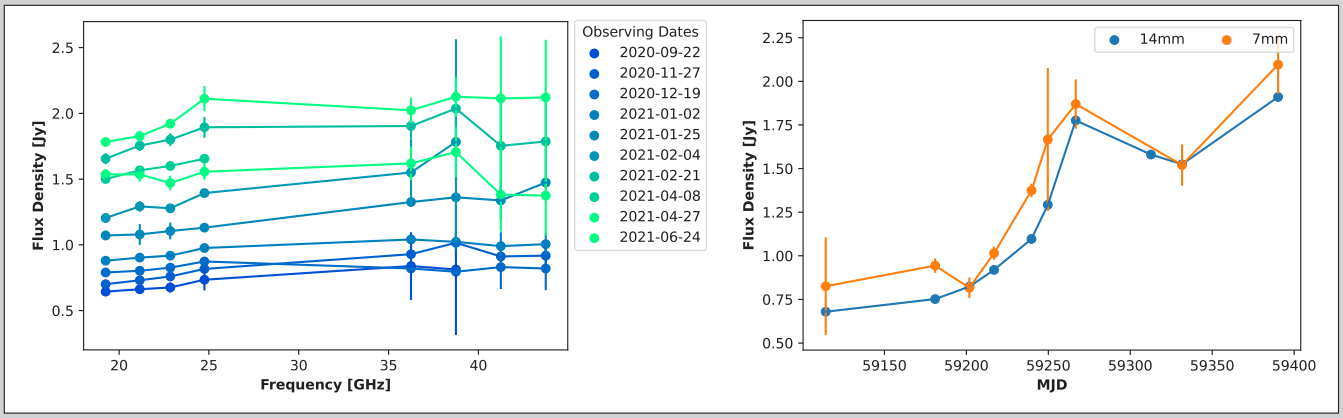

Figure 2: Example results of spectra (left) and light curves (right, averaged over all subbands) for the source S2 0109+22.

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