

# Particle acceleration in Ultra Fast Outflows

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## SF2A Abstract

Ultra Fast Outflows (UFOs) are sub-relativistic dense winds of wide aperture angle, launched from Active Galactic Nuclei, at which strong shocks (Mach number 1) are expected to form.

At these shocks, particle energisation through diffusive shock acceleration (DSA) should lead to the copious production of gamma rays and neutrinos, in the interaction of accelerated charged particles and the surrounding circumnuclear medium.

We model proton acceleration through DSA at UFO shocks and estimate the associated high-energy gamma-ray and neutrino fluxes, and investigate the prospects for detection with current and next generation gamma-ray and neutrino observatories.

For a selected list of nearby UFOs, we identify the best candidates for detection with next generation gamma-ray observatories such as CTAO, and discuss the potential for detection with neutrino observatories such as IceCube.