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Abstract:

TeV halos around middle-aged pulsars have been detected by HAWC and LHAASO. These spatially-extended sources have become the most dominant TeV-PeV gamma-ray sources. So far, no TeV halo powered by millisecond pulsars (MSPs) is found, while studies suggest that MSPs produce diffused TeV gamma-ray emission with a similar efficiency to that observed from known pulsar TeV halos. KM2A J1918+1557 is a newly-discovered source detected by LHAASO/KM2A with no clear origin, and indeed, the source region includes three millisecond pulsars and one middle-aged pulsar, while no other nearby power source such as supernova remnants are found. Hence, KM2A J1918+1557 is a good candidate of MSP-powered TeV halo. A total of 4.7 hours are requested to reveal if the spin-down luminosity of these pulsars are sufficient to power KM2A J1918+1557.