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Evidence for a dark matter particle

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The author published a proposal in 1985 that suggested cosmic rays are emitted from AGN (Active Galactic Nuclei) or massive black holes. In that proposal, the knee energy in the cosmic ray energy spectrum is the interface between the radiation-dominated expansion rate and the matter-dominated expansion rate for an expanding heat bath. As such, it requires the existence of a particle of mass at 3 PeV, the knee energy value. Assuming that this provides a mass scale for new physics, one can compute the mass of the dark matter particle as the lowest mass state of the new physics. Choosing a supersymmetric theory which provides a large mass ratio, one can predict the dark matter particle mass of 8.1 TeV. The analysis of a recent HESS data shows a gamma ray spectrum that peaks at 7.6 \pm 0.1 TeV. The agreement between the theoretical prediction and the observational data suggests the search for the other predicted particles with the mass of 26.8 TeV, 78.0 TeV and 3 PeV.

Biography

Yukio Tomozawa obtained DSc in 1961 from Tokyo University. He was Assistant Researcher at Tokyo University (1956) and at Tokyo University of Education (1957-1959) -Member at the Institute for Advanced Study, Princeton, NJ (1964-1966). He was Assistant Professor, Associate Professor, Professor and Emeritus Professor at the University of Michigan, USA. He found that the Schwarzschild metric does not fit the data of time delay experiment in the field of general relativity. He has introduced a physical metric which fits the data. It was constructed with the constraint that the speed of light on the spherical direction is unchanged from that in vacuum. This modification changes the way we understand the nature of gravity drastically. In particular, the nature of compact objects, neutron stars and black holes, is very different from that described by the Schwarzschild metric. It also explains the dark energy, supernova explosion and high energy cosmic ray emission from AGN (Active Galactic Nuclei), massive black holes.

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