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Lower limits on ultrahigh-energy cosmic ray and jet powers of TeV blazars[1] SOEBUR RAZZAQUE, George Mason University, CHARLES DERMER, JUSTIN FINKE, Naval Research Lab — Lower limits on the power emitted in ultrahigh-energy cosmic ray (UHECR) protons are derived for TeV blazars with the assumption that the observed TeV gamma rays are generated due to interactions of these protons with cosmic microwave photons. This mechanism may be at work in four blazars, namely 1ES 0229+200; 1ES 1101-232; 1ES 0347-121 and 1ES 1426+428, which are at sufficiently high redshift (>0.1) that allow efficient cascade development to make TeV emission and which are non-varying or very weakly varying at >TeV energies. The lower limits on the UHECR power are lower than the respective synchrotron luminosities in case of all blazars except for 1ES 1426+428. The proposed Auger North Observatory can detect 40 EeV cosmic rays from this extraordinary source and test the UHECR-generated TeV emission model, which requires the intergalactic magnetic field strength to be below 10^{-16} G. The lower limits on the jet power for all four TeV blazars exceed the Eddington luminosity of a 10^9 solar mass black hole in case the injected UHECR spectrum is softer than -2.2.

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