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Ultra high energy cosmic rays from black hole jets of radio galaxies CHARLES DERMER, S. RAZZAQUE, J.D. FINKE, NRL, A. ATOYAN, Concordia University, Canada — The Auger Collaboration reports [1, 2] that the arrival directions of >60 EeV ultra-high energy cosmic rays (UHECRs) cluster along the supergalactic plane and correlate with active galactic nuclei (AGN) within 100 Mpc. The association of several events with the nearby radio galaxy Centaurus A supports the paradigm that UHECRs are powered by supermassive black-hole engines and accelerated to ultra- high energies in the shocks formed by variable plasma winds in the inner jets of radio galaxies. The GZK horizon length of 60 EeV UHECR protons is 100 Mpc, consistent with a largely proton composition of the UHECRs. In this scenario, the sources of UHECRs are FR II radio galaxies and FR I galaxies like Cen A with scattered radiation fields that enhance UHECR neutral-beam production. Radio galaxies with jets pointed away from us can still be observed as UHECR sources due to deflection of UHECRs by magnetic fields in the radio lobes of these galaxies. A broadband $\sim$ 1 MeV - 10 EeV radiation component in the spectra of blazar AGN is formed by UHECR-induced cascade radiation in the extragalactic background light (EBL). This emission is too faint to be seen from Cen A, but could be detected from more luminous blazars.

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