Electroweak Physics & Ultrahigh Energy Cosmic Rays

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The observation of ultra high energy cosmic rays beyond the Greisen-Zatsepin-Kuzmin (GZK) cutoff energy has stirred up tremendous amount of interest [1] in the community of cosmology and particle astrophysics. We examine how an ultra high energy proton/antiproton be transformed into a "jet" consisting of many different species and elaborate on the various electroweak physics which go into play in the problem. We propose that such ultra high energy charge hadrons, as driven by the cosmo accelerators such as huge black holes (quasars), account for the observed events above the GZK energy.

References

[1] For an excellent review, see, e.g., F. Halzen, astro-ph/0111059.