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**On Estimating the Relative Flux of the Brightest Cosmic Ray Source above 6x10$^{19}$ eV**[1] PATRICK YOUNK, Colorado State University — Recent observations by the the Pierre Auger Observatory support the hypothesis that ultra-high energy cosmic rays originate in astrophysical environments external to the galaxy and that the Greisen-Zatsepin-Kuz'min (GZK) effect is in operation. The GZK effect is a prediction made 40 years ago that the highest energy cosmic rays suffer energy losses due to interactions with the cosmic microwave background and that the majority of cosmic rays above 6x10$^{19}$ eV (super-GZK) must originate from sources within 200 Mpc. In this talk, we will demonstrate that this hypothesis implies that the relative flux of the brightest super-GZK source is at the few percent level or above. This prediction is robust with regard to assumptions on the source type or source space density. The Pierre Auger Observatory observes approximately 20 super-GZK events per year. Therefore, it is expected that over the course of several years, tens of events from a single extragalactic cosmic ray source will be seen. This will be enough statistics to measure specific properties of the source; cosmic ray astronomy will have begun.

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