Abstract Submitted
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Connecting the kinetic flux of X-ray jets to a spinning, supermassive black hole.[1] DAN SCHWARTZ, Harvard-Smithsonian CFA — We model the X-ray emission of large scale quasar jets as due to inverse Compton scattering off the cosmic microwave background. This allows an estimate the kinetic flux of the jet to be made based on direct measurements of the jet itself! We use this model to estimate the kinetic fluxes carried by 31 quasar jets detected in a survey by Marshall et al. (2005, 2011, 2018). Massive black holes greater than 10^8 solar mass with spin parameters greater than 0.3, can provide this energy for millions of years via the Blanford/Znajek (1977) effect. Equating the kinetic flux to the energy flux emitted from the vicinity of the black hole, and assuming the latter is initially a pure Poynting flux, we can estimate the magnetic field strength at the gravitational radius of the hole, and find it comparable to strengths deduced for magnetically arrested disks (Narayan+ 2003). Since the Poynting vector carries both the energy and the angular momentum lost by the black hole, we can derive constraints on the magnetic field as a function of jet radius.

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