

External Compton Model 2: Sikora, Begelman, & Rees (1994)

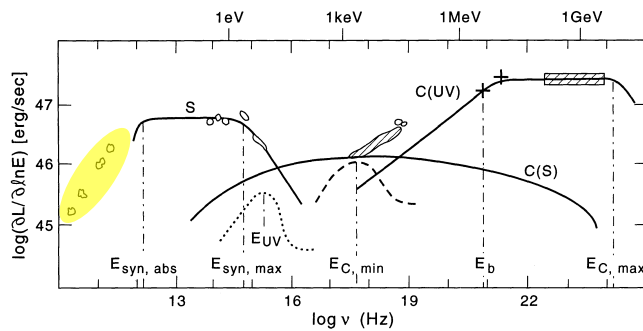


FIG. 1.—Spectrum of 3C 279. Solid lines mark the model spectrum components: (S): synchrotron radiation; C(S): Comptonized synchrotron radiation; and C(UV): Comptonized diffuse UV radiation. In addition, the central UV radiation spectrum is shown (dotted line), along with a possible component due to Comptonization of diffuse UV radiation by cold electrons in the jet (dashed line). Observations are depicted from the following sources: Makino et al. (1989) for the radio–X-ray range, during high states; Hermsen et al. (1993) for soft gamma-ray measurements from Comptel (crosses); and Hartman et al. (1992) for hard gamma-ray measurements from EGRET. The model parameters are specified in the text.

- γ -ray origin: Comptonized ambient ("external") photons
- X-ray/ γ -ray spectral break: cooling of hi-E relativistic e- dist.
 - ▶ Test: Δ spect. idx. always ≈ 0.5
- "One zone" of size $\Delta r \lesssim r$, $r \gg r_{\text{central}}$
 - ▶ Test: simultaneous fluctuations across γ -ray E
- γ -ray and UV/Optical from same e- population
 - ▶ Test: UV/Optical spect. idx. \approx hard γ -ray spect idx.
 - Vary in-phase
 - ▶ Hedge: Unless there are other radiating cpts.

- Flare model: "pattern" that propagates along jet
- 3 Flare Parameters
 - ▶ $\beta p'$: pattern velocity
 - ▶ $\Delta t'$: radiation event timescale
 - ▶ $\eta \leq 1$: element radiation time ratio

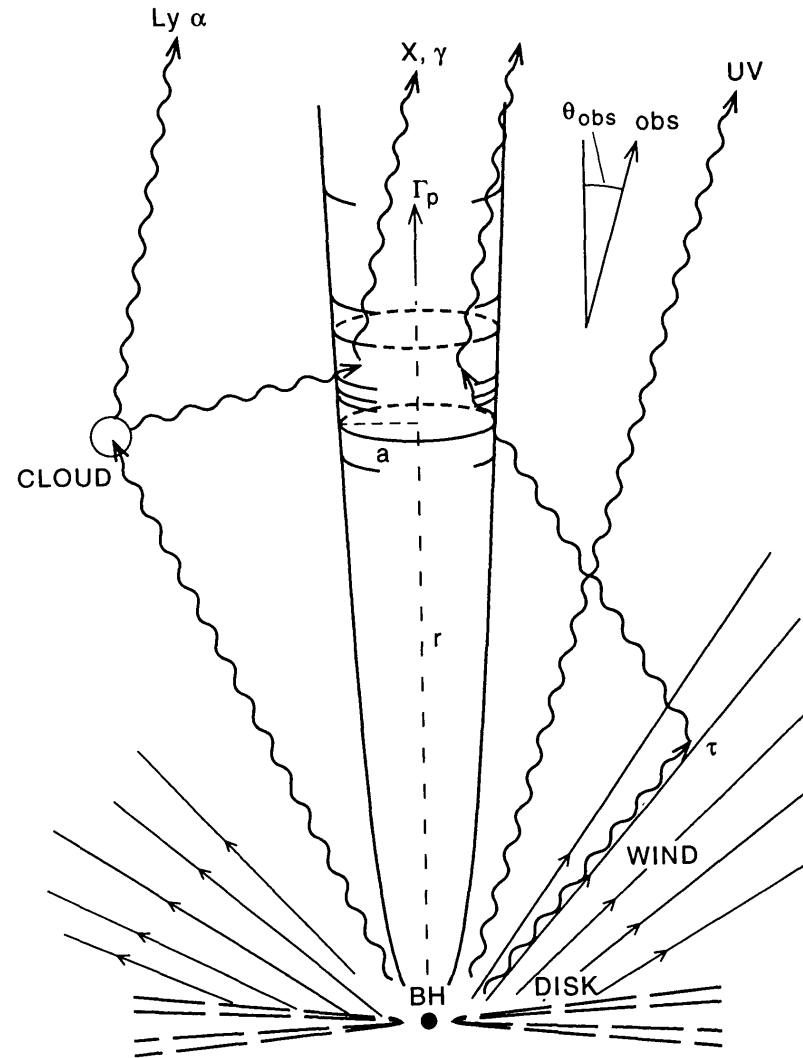


FIG. 2.—Geometry of the source. The radiating region, denoted by short cylinder of dimension a , moves along the jet with pattern Lorentz factor Γ_p . Underlying flow moves with Lorentz factor Γ , which may be different.