Observed afterglows (optical to X-ray)

Explanation: Collisions with surrounding medium

$\epsilon_\gamma \sim 10^2$ eV; $\epsilon_p \sim 2 \times 10^{10}$ GeV

π^+ : $\epsilon_\nu \sim 10^9$ GeV (spectrum calculated)

Time: begins with afterglow ($\gtrsim 10$ sec)

Duration: GRB duration (0.1 secs-mins)

Direction: GRB; Flux: 0.2 km^{-2} yr^{-1}

Flavor: ν_e (at the GRB)