

**Introduction**  
**Fireball Models**

(1)  $f_{\nu}(t) \propto t^{-\alpha}$

$f_{\nu}$   
 $\alpha$   
 $\alpha$   
 $\beta$   
 $\alpha$   
 $\beta$   
 $\beta$   
 $\alpha$

**spectral model**

$cm_2^{-2}$   
 $s$   
 $MeV_2^{-2}$   
 $cm_2^{-2}$   
 $s$   
 $MeV_2^{-2}$   
 $sr$

**Power law**

(2)  $\frac{dN}{dE} = N_o(dE/E_o)^{-\gamma}$

$N_o$   
 $\gamma$   
 $E_o$

**Broken Power Law:**

(3)  $\frac{dN}{dE} = N_o$

**Simple empirical model**

	Class of GRBs	LC with Break 1	LC with Break 2	LC with Break 3	Total
□	Short GRB	2	3	5	10
	Long GRB	3	2	5	10
	Total	5	5	10	20