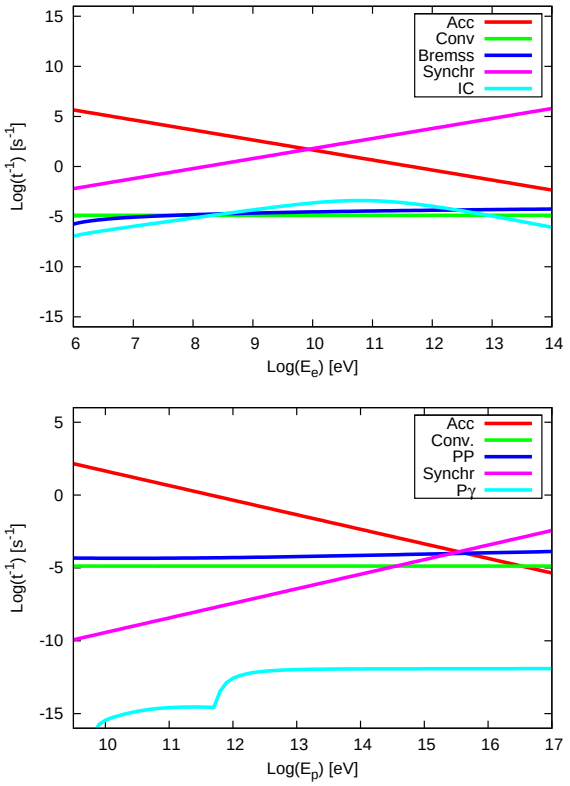


Fig. 1. Radiative looses and acceleration rate.

$$\frac{\partial}{\partial E}\left[\frac{\mathrm{d}E}{\mathrm{d}t}\bigg|_{\rm loss} N(E)\right] + \frac{N(E)}{t_{\rm esc}} = Q(E), \qquad (2)$$

where $Q(E)$ is the injection function in steady state. The particles can escape from the acceleration region through wind convection:

$$t_{\rm esc} \sim R/v_{\rm w}, \qquad (3)$$

here $v_{\rm w}$ is the wind terminal velocity.

The solution to the equation is

$$N(E) = \left|\frac{\mathrm{d}E}{\mathrm{d}t}\right|^{-1}_{\rm loss} \int_E^{E^{\rm max}} \mathrm{d}E' \, Q(E') \exp\Big(-\frac{\tau(E,E')}{t_{\rm esc}}\Big), \qquad (4)$$

where

$$\tau(E,E') = \int_E^{E'} \mathrm{d}E'' \left|\frac{\mathrm{d}E''}{\mathrm{d}t}\right|^{-1}_{\rm loss}. \qquad (5)$$

The dominant radiative processes are: proton-proton interactions with the magnetosphere material; synchrotron emission for protons, electrons and for secondary pairs from the proton-proton interactions (Orellana et al. 2007); relativistic bremsstrahlung and inverse Compton scattering for

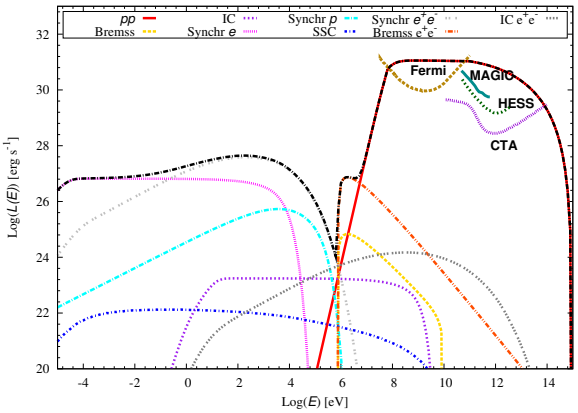


Fig. 2. Computed non-thermal spectral energy distribution.

electrons and secondary pairs (e.g., Vila & Aharonian 2009). We assume that interaction volume with matter is a small fraction, $\sim 10^{-4}$ of the total magnetosphere volume.

The nearest T Tauri stars are localized in low-mass star forming regions. We consider a standard source at $d \sim 150$ pc. The high-energy radiation produced in the source can be absorbed through photon-photon interaction (Gould & Schréreder 1967). Figure 2 shows the computed non-thermal emission corrected by photon absorption. We also show the sensitivity curves, for a source at 150 pc, of the high-energy detectors Fermi, Magic, HESS and CTA.

## 3. CONCLUSIONS

T Tauri stars can produced high-energy radiation. Nearby sources might be detectable. These stars can be the counterparts of some of the unidentified galactic gamma-ray sources.

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