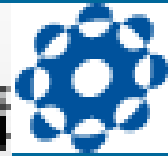




KEK

大学共同利用機関法人

高エネルギー加速器研究機構



Gamma-ray flare and absorption in Crab Nebula:

Lovely TeV–PeV astrophysics

KK, Ohira and Ioka, MNRAS in press (2012) arXiv:1202.6439

Kazunori Kohri

郡 和範

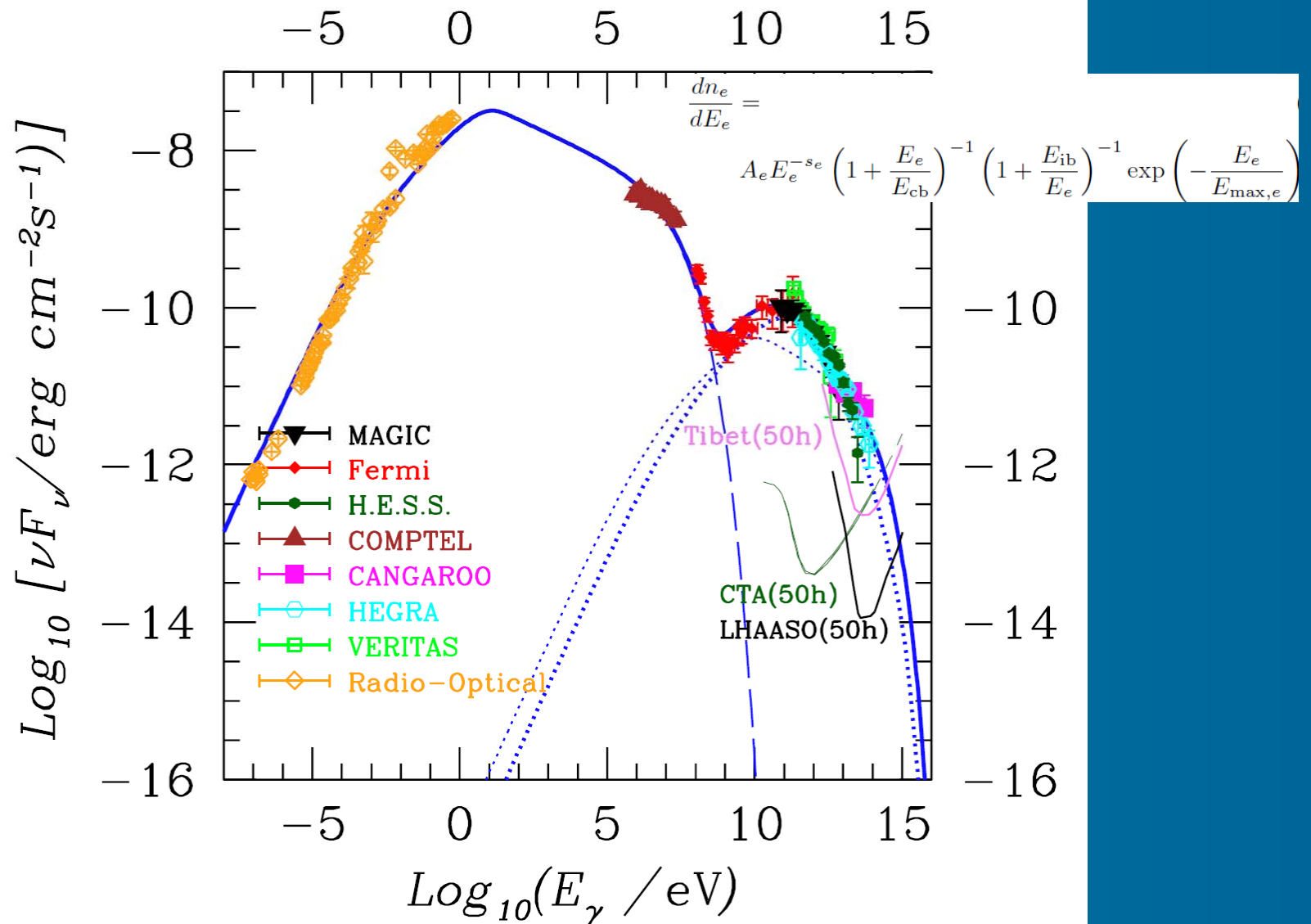
KEK and Sokendai, Tsukuba, Japan

w/ Kunihiro Ioka and Yutaka Ohira

井岡 邦仁、大平 豊

Spectrum of Crab Nebula

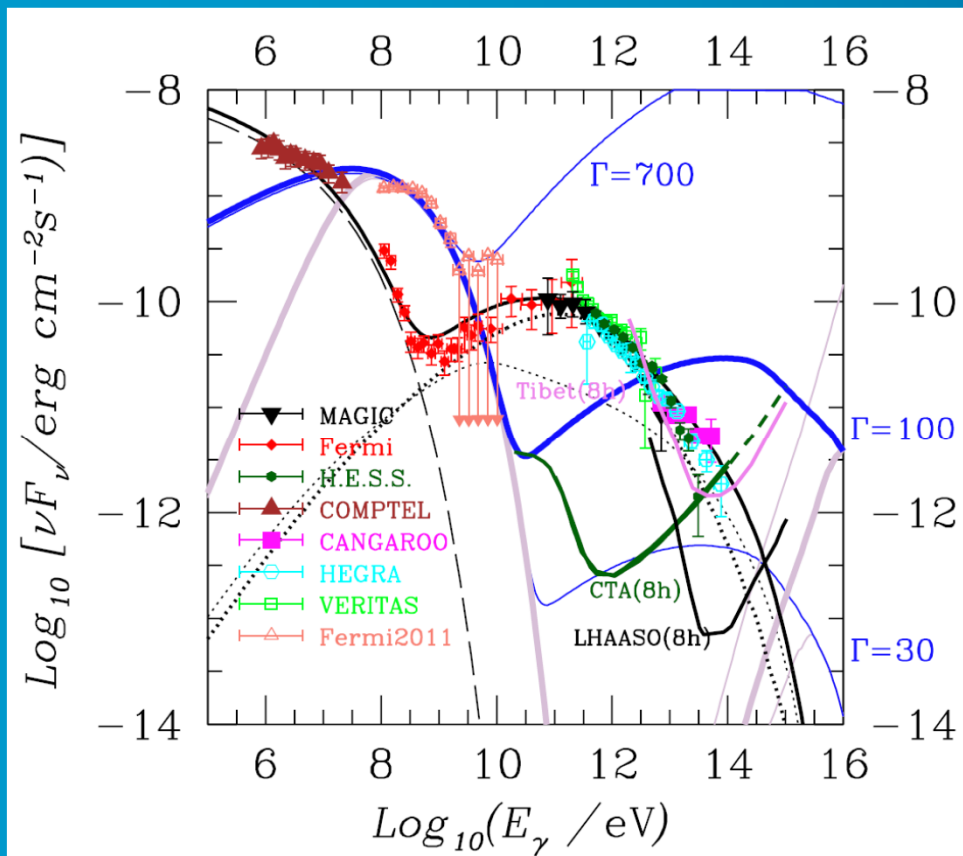
KK, Ohira and Ioka, MNRAS in press (2012) arXiv:1202.6439



TeV flare accompanying the GeV flare

KK, Ohira and Ioka, MNRAS in press (2012) arXiv:1202.6439

Inverse Compton by electrons in Small blobs Lorentz-boosted towards us

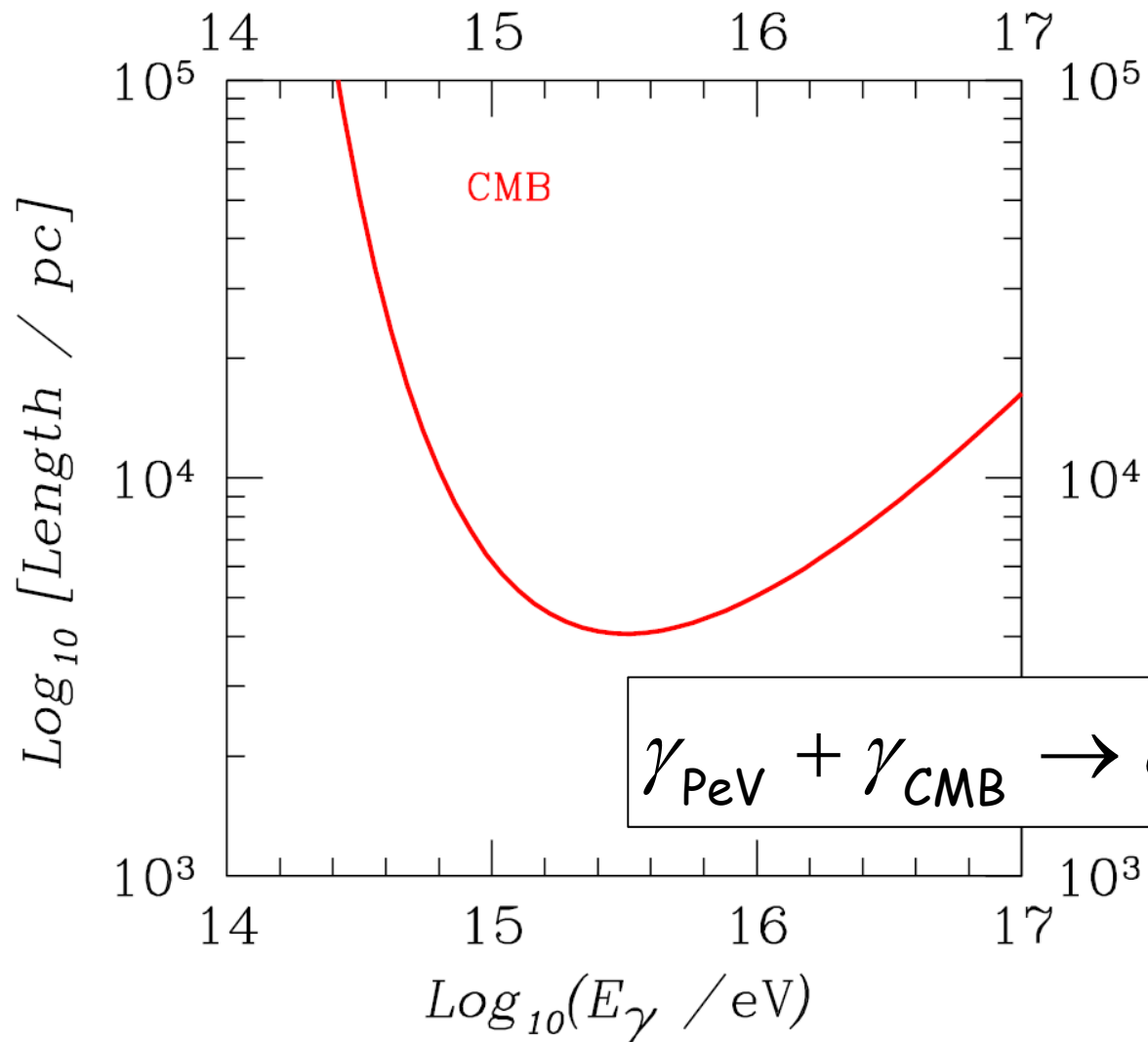


$$\frac{\nu F_{\nu, IC}}{\nu F_{\nu, Syn}} \propto \Gamma^2$$

- $E > E_{syn, max} \sim 160 \text{ MeV}$
- $\Delta t_{obs} < 8 \text{ hours}$

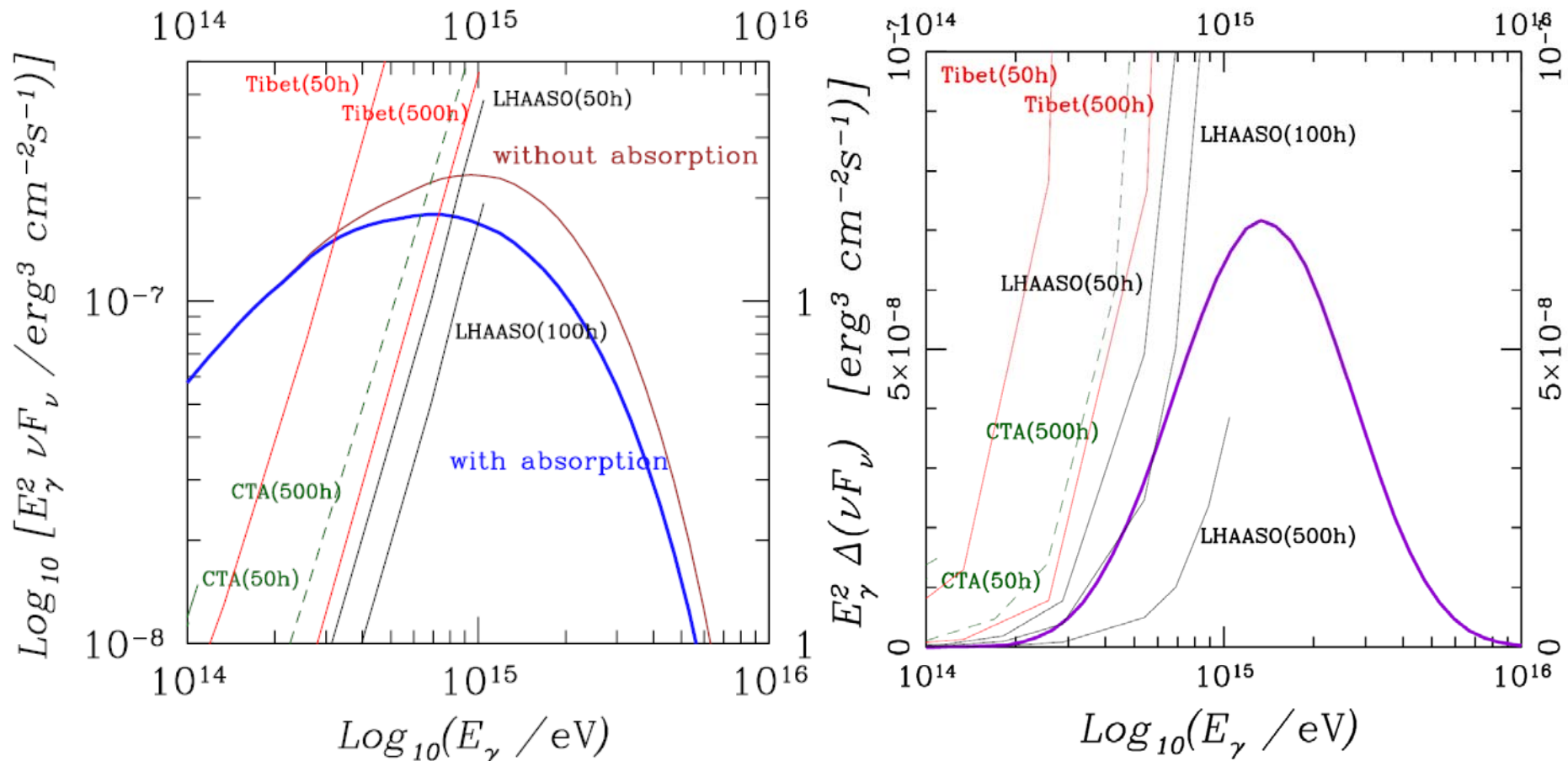
Gamma-ray horizon

KK, Ohira and Ioka, MNRAS in press (2012) arXiv:1202.6439



Absorption by CMB

KK, Ohira and Ioka, MNRAS in press (2012) arXiv:1202.6439



Conclusion

- We will inevitably observe the TeV flare from Crab Nebula through inverse-Compton by high-energy electron, with accompanying the synchrotron GeV flare
- By using CTA or LHAASO, we will be able to observe absorption of Crab Nebula's PeV photon by CMB photon