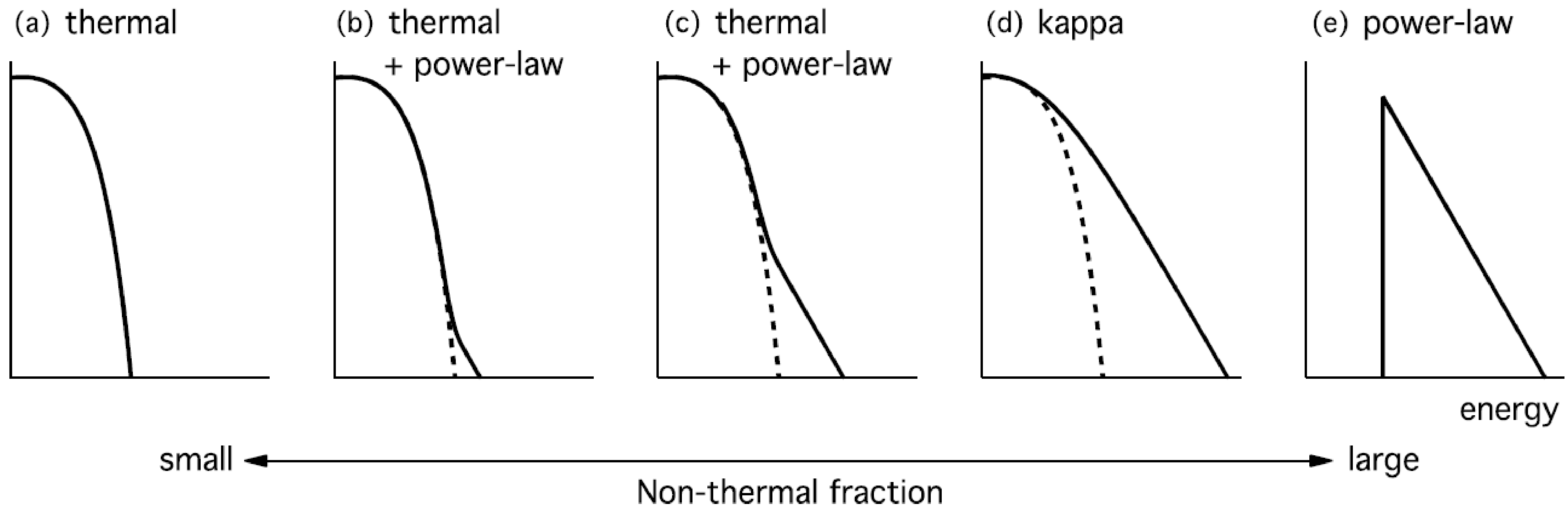
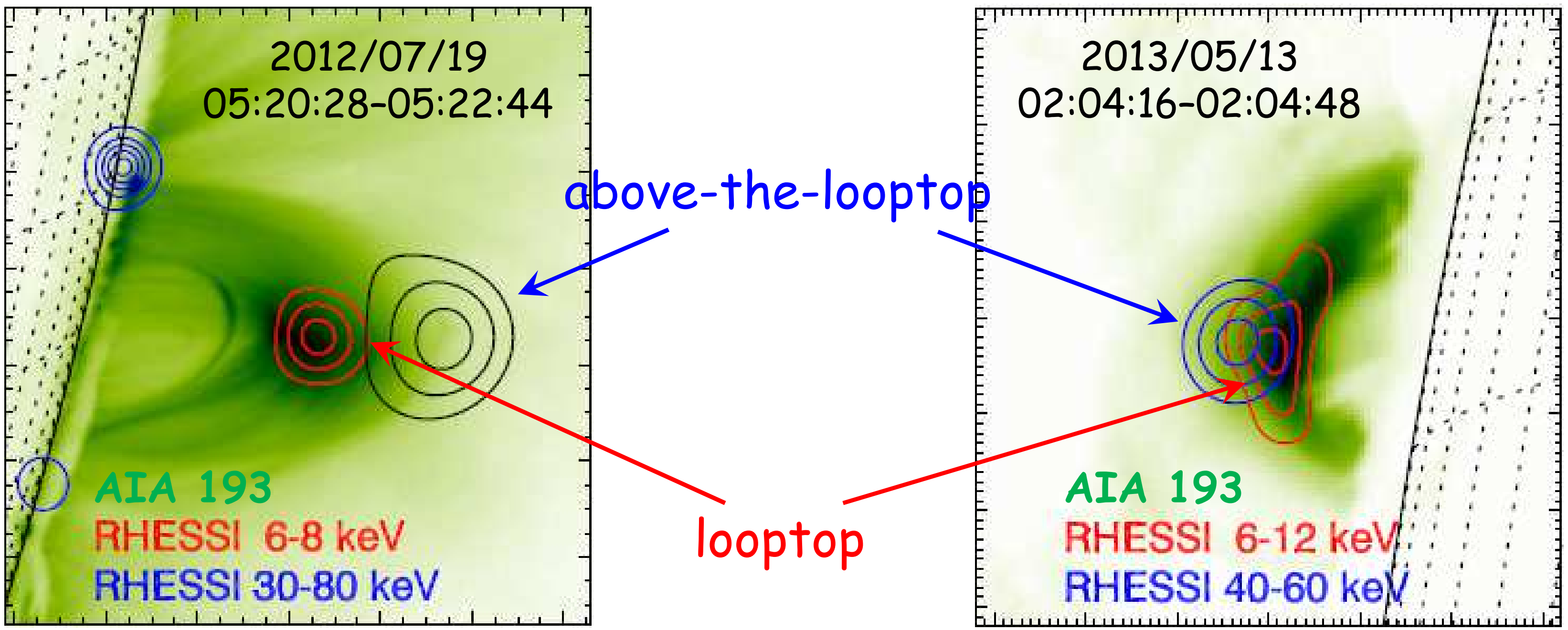
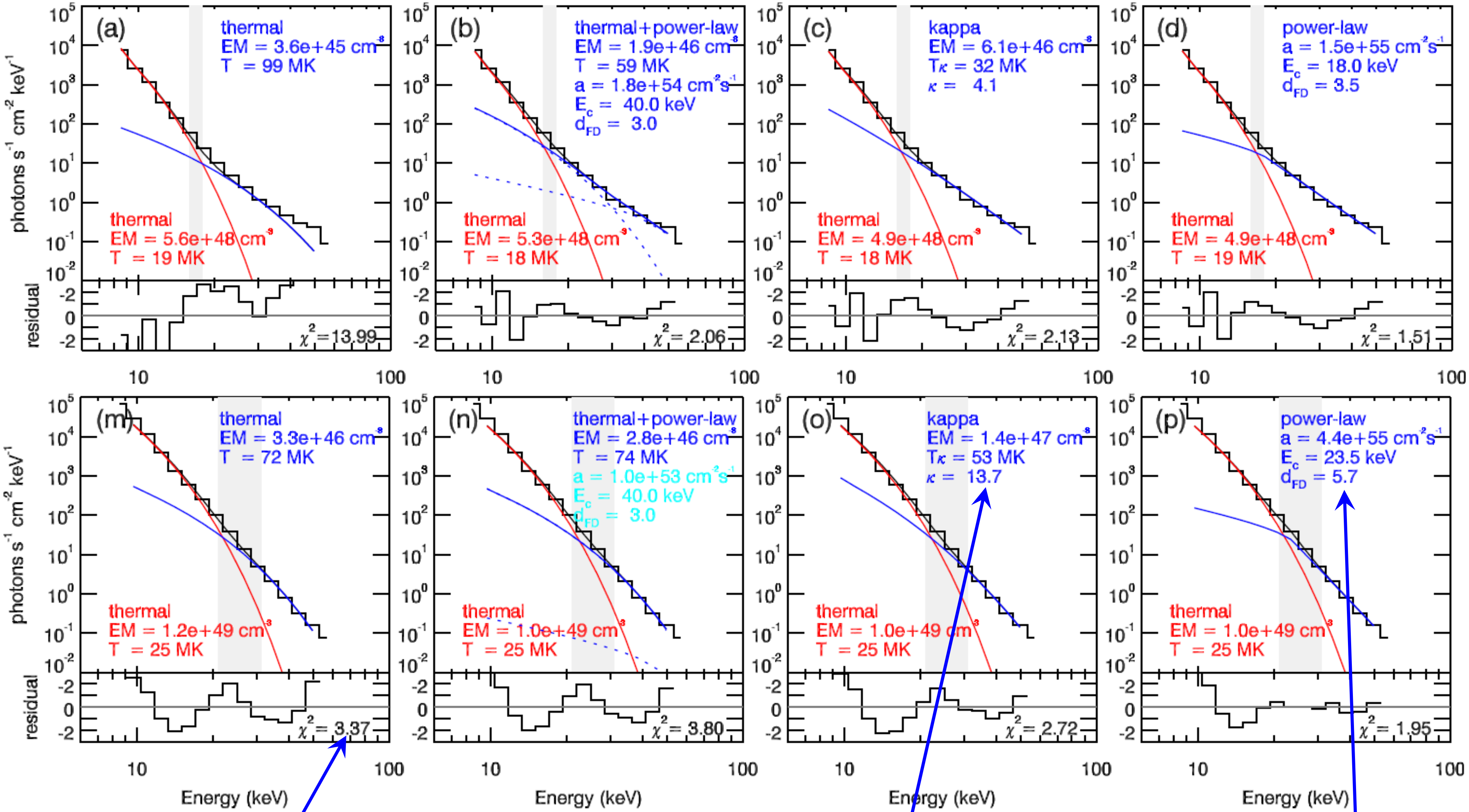




Oka et al. (2015)

The thermal+power-law model systematically overestimates and underestimates the temperature and density, respectively, due to the lower-energy cutoff E_c.



less enhanced nonthermal tail

close to Maxwellian

less significant nonthermal component

https://hesperia.gsfc.nasa.gov/ssw/packages/spex/idl/object_spex/fit_model_components.txt

Oka et al. (2015)

Thin-target Bremsstrahlung:

incident electron distribution is nearly unchanged, evolves slowly under the influence of collisions

Thick-target Bremsstrahlung:

incident electrons are completely stopped or thermalized in the high-density target
substantial change in incident electron distribution
much quicker energy loss from electrons → lots of X-ray photons emitted → intense X-ray emissions (~10 keV–300 keV)

The photon flux emitted per unit energy observed at a distance R is obtained by integrating over the emitting source volume V or, for an imaged source, along the line-of-sight through the source region.

Holman et al. (2011); Kontar et al. (2011); White et al. (2011); Oka et al. (2018)

$F(E,\mathbf{r})$: electron flux density distribution

electrons cm^{-2} s^{-1} keV^{-1}

$F(E)$: electron flux distribution

electrons s^{-1} keV^{-1}

$f(E,\mathbf{r})$: electron density distribution

electrons cm^{-3} keV^{-1}

$$F(E,\mathbf{r}) = f(E,\mathbf{r})v(E)$$

assume $F(E,\mathbf{r}) \propto E^{-\delta}$, $f(E,\mathbf{r}) \propto E^{-\delta'}$

$$\gamma_{thin} = \delta + 1, \ \gamma_{thick} = \delta - 1$$

$$\gamma_{thin} = \delta' + 0.5, \ \gamma_{thick} = \delta' - 1.5$$

Holman et al. (2011)