X-Ray Measurement of Particle and Field Energy Distributions in Lobes of Radio Galaxies

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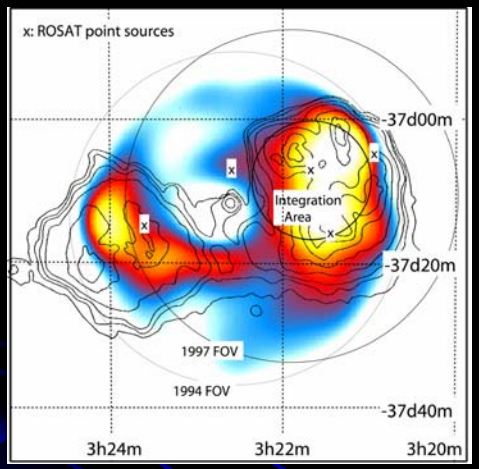
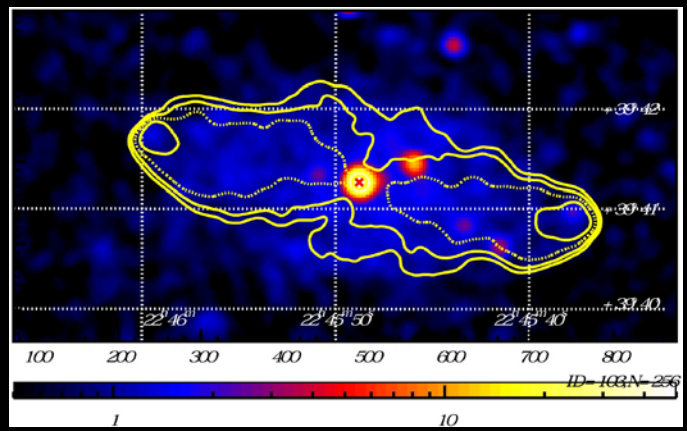
➢ Detection of Inverse Compton X-ray emission from lobes of 8 radio galaxies with *ASCA*, *Chandra*, and *XMM-Newton*

Fornax A with *ASCA*

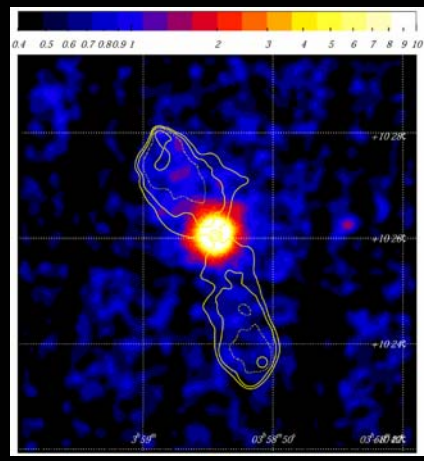


3C 452 with *Chandra*



Color : X-ray , Contour : Radio

3C 452 with *Newton*



➢ Determination of energy densities of electrons (u_e) and magnetic field (u_m), and their spatial distributions, by comparing the X-ray and radio fluxes.

- ◆ Typically $u_e \gtrsim 10\ u_m$
- ◆ Total electron energy $u_e V \propto L_X$
  Total magnetic energy $u_m V$: independent
  L_X : X-ray luminosity of the nucleus
- ◆ u_e : relatively uniform
  u_m : becomes stronger toward the lobe periphery