Imaging of faint extended objects

- Limiting factors: a) contrast relative to the background, and b) ability to separate out point sources

- Chandra particle background is VERY stable
- A large fraction of the CXB is resolved into sources with ~100 ksec class exposures.
- The bulk of background clusters and groups are detectable in ~100 ksec exposures.

- Unfortunately, ACIS contamination has greatly reduced effective area below 1 keV.
- Chandra 1/4 keV particle background is 1/10 of XMM’s [CCD event grade screening] — and this band is not affected by contamination. Much better contrasts than XMM.
Chandra XVP mosaic of A133

- 33 pointings, 2.4 Msec total (1 month) exposure, $\sim 1 \times 1$ deg mosaic. $\sim 150$ ksec exposure in each location
- a factor of $10^6$ brightness contrast
- faintest detectable structures are 4% of the CXB and 0.5% of the particle-induced background
Importance of being able to remove the CXB

If clumps and filaments included, $\times 5$ bias in $S_x$, $\times 2$–$3$ in $\rho_{\text{gas}}$, $\times 0.85$ in $T$, $\times 0.45$ in entropy
Possible topics

• More cluster and galaxy group outskirts

• High-density large scale structures from future LSS surveys (distant superclusters, super-great-walls, galaxy cluster progenitors during initial collapse)

• Galaxy winds, CGM

• ISM structures in the Milky Way