A radial temperature profile of the cluster A1835 with Chandra

Basic Steps:

1. In the Chandra archive, find non-gratings observation of A1835 performed after 2000-01-29 (ACIS temperature –120C). Obsid:
2. What mode was Chandra observing in:
3. Do data need to be reprocessed? Why or why not? (Hint: check what processing is applied to the respective background file)
4. Check light curve for background flares.
5. Create image of the cluster, subtracting the backgrounds (blank-sky and readout artifact) and dividing by the exposure map.
6. Extract cluster spectrum within $r = 1$ Mpc and determine mean cluster temperature and bolometric luminosity. (Hint: at this step, the excess Galactic background can be ignored)

Advanced Topics:

1. Extract spectra in several annular regions.
2. Extract spectrum from a region far from the cluster (e.g., $r > 2.5$ Mpc, using chips I2, I3, S2). Do you see the excess soft background?
3. Fit cluster spectra in annuli (hint: take excess background into account by adding a model component normalized by the ratio of region areas). Is there a cool core in this cluster?
4. At what radii the Galactic excess background becomes important?

Suggested reading: 1. "On the discrepancy between Chandra and XMM temperature profiles for A1835", Markevitch 2002, astro-ph/0205333 (beware some steps there are outdated). 2. Background cookbook, `cxc.harvard.edu/cal/Acis/Cal_prods/bkgrnd/acisbg/COOKBOOK`