The physical process producing X-ray emission in brown dwarfs (BDs) is still not well understood. In young BDs, X-ray emission is thought to be produced by some kind of magnetic activity and/or accretion (as in T Tauri stars), but the low frequency of detections does not permit to achieve robust conclusions. Only a small fraction of the BDs in known star-forming regions has been detected in X-ray. Investigating the characteristics of the X-ray emission of a larger sample of BDs is needed to understand the process producing high-energy emission in these objects. We have taken advantage of the high sensitivity of the EPIC on board the XMM-Newton satellite to study the X-ray properties of brown dwarfs candidates of the Chamaleon I molecular cloud selected from the literature. Our sample increases the number of BDs detected in X-rays in Cha I by a factor of ten. Our aim is to investigate whether the X-ray emission coming from these objects is similar or not to that of T Tauri stars of the same region.

To identify brown dwarfs we cross-correlated the detected X-ray sources with the data in López-Martí et al. (2004) and Luhman et al. (2004) which provide a spectral classification of stars in the Chamaleon I molecular cloud based on their IR colours and long slit optical spectra, respectively. We found X-ray counterparts for eleven objects classified as brown dwarfs in the Luhman works. For nine of those objects, the amount of counts was enough to obtain a spectrum. In those cases, we used the XSPEC software to analyze the X-ray spectra. Results for the fitting using the Astrophysical Plasma Emission Code (APEC) model are shown in the table and in the figures below. We used a fixed value of $Z = 0.3 Z_{\odot}$ for the abundances motivated by previous works on this region (Stelzer et al. 2004; Robrade & Schmitt 2007). With the exception of one object, we used a one-temperature (1T) model to fit the data to obtain general properties of the emitting plasma.

The study is based on XMM-Newton data of the Chamaleon I molecular cloud. Observations were taken using the three European Photon Imaging Cameras (EPIC) operated simultaneously in full frame mode for different fields. For the reduction we used the XMM-Newton Science Analysis System software (SAS) to derive a table of calibrated events. Then, different filters were applied to eliminate bad events and noise.