POPULATION SYNTHESIS STUDIES OF DA WHITE DWARFS: CONSTRAINTS ON COOLING, BIRTHRATE AND SOFT X-RAY SPECTRA EVOLUTION.

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Using population synthesis technique analagous to those described by Popov & Prokhorov (2007) we are able to confront our model assumptions with observations by ROSAT All-Sky Survey. This allows us to constrain some aspects of evolution of X-ray emission, which are linked to the diffusional evolution of heavy elements in WD atmospheres.

Starting with the following model assumptions: exponential disc spatial distribution ($R_{scale} = 3000\ kpc$, $h_{scale} = 250\ pc$), WD mass distribution from Liebert et al.(2005), cooling curves computed by code described in S.I. Blinnikov & N.V. Dunina-Barkovskaya (1994) and spectra computed by code by V. Suleimanov et al. (2006), we are able to constrain $\max T_{eff}$ of DA WDs in EUV/soft X-rays. However, precise analysis of cooling curves and spectra with diffusion history of helium and heavier elements in envelopes of DA WDs is required.

We present Log N–Log S distributions for various initial spatial distributions (including the one with Gould belt), various assumptions about cooling or diffusion of elements and abundances in DA WDs. It is shown that the resulting Log N–Log S is very sensitive to assumptions about the diffusion of elements and cooling, whilst the birthrate and spatial distribution are less important.