

The beginning of the theoretical section of this diploma thesis is pointed to a discovery of the gamma-ray bursts. Then it is pointed to a brief historical summary of the different instruments dedicated to the GRB's field. Because the main aim of this work is the basic analysis and the classifying of the observed gamma-ray bursts by RHESSI solar satellite (which has observed more than 220 GRBs yet), a technical description of this instrument is introduced. It is followed by a part about gamma-ray production mechanisms. In this work there are also mentioned some related gamma-ray sources e.g. SGRs. The theoretical résumé is concluded by the description of the GRB's afterglows and some preferred models of their origins. In the proper study there was done the morphological classifying of the GRB's temporal profiles. Next there was studied the duration distribution with orientation to determine number of the subclasses using lognormal fits and the χ^2 test. Distribution of the radial distances of the gamma-ray sources can be examined by the $\log N$ vs. $\log P$ dependence. The results are properly discussed and compared with the results of the BATSE instrument (including the V/V_{\max} test). In the final stage of this work, there is argued the dependence between the hardness ratios and the durations.