


# White Paper: SVOM ADVANCES ON GRB SCIENCE (SVOM CORE PROGRAM)

## Five first chapters (GRB physics)

Coordinator: F. Daigne

- **Header:** will include useful information on GRB classification used in following chapters  
*In charge: E.W. Liang / Y.W. Yu*
- **Chapters: we clarified the frontiers between chapters and identified the missing content**
  - 4.1** The population of classical long GRBs: physical mechanisms  
*Add: prompt & afterglow physics/SVOM observations for long GRBs*  
*In charge: F. Daigne / Y.F. Huang*
  - 4.2** The population of classical long GRBs: characterization of the population  
*Add: discussion of dark GRBs, of GRB host galaxies (with reference to 4.8), of the GRB-SN association*  
*In charge: S. Vergani, D. Xu*
  -  **4.3** The diversity of stellar explosions *[title may change to be more specific]*  
*Modify to focus only on long GRBs (short GRBs discussed in 4.4)*  
*In charge: R. Mochkovitch / B. Zhang*
  - 4.4** The population of short GRBs  
*Emphasize importance of redshift measurement for GW counterparts*  
*In charge: J. Osborne / G. He / L.X. Li*
  - 4.5** GRBs as particle accelerator  
*Add: discussion of the SVOM-CTA synergy*  
*In charge: D. Dornic / Z. Li / X.Y. Wang*

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### ■ **Figures: we decided for four figures**

*In charge: S. Antier, M.G. Bernardini, F. Piron & F. Daigne*

- Fig. 1 : an example of the prompt spectrum of a long GRB simulated in ECLAIRs+GRM (select an interesting case with 2 spectral components)
- Fig. 2 : an example of the lightcurve of a long GRB simulated in ECLAIRs+GRM+MXT (light curve in counts for ECLAIRs+GRM, linear scale + flux in log-log ECLAIRs+GRM+MXT)

*Goal: extend to other SVOM instruments for future versions*

- Fig. 3 : an example of the prompt lightcurve of a short GRB with an extended soft tail simulated in ECLAIRs+GRM
- Fig. 4 : a figure describing the capacity of SVOM to explore the different classes of GRBs = diagram peak energy vs duration (log scale)  
1 point per GRB in published catalogs (BATSE, GBM, HETE2, Swift+Konus/GBM)  
left: color code for the instrument (BATSE, GBM, HETE2, Swift+Konus/GBM)  
right: color code for the detection probability by ECLAIRs

- **Work in progress:** modified text of chapters will be finished for Wed. 20 April  
complete v1 of the 5 chapters+figures+bibliography for the end of April

future versions (v2: PDR ?, v3: end of the year ?, ...): room for improvement (figures ?)

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- We aim to include a light curve of a Swift short GRB with extended emission as seen by ECLAIRs & GRM
- There was a discussion whether to also include this summarising figure from Ann Rev Nuc Part Sci

