

# **Les sursauts gamma avec Fermi, Swift et X-Shooter : situation et perspectives**



## **Report of Contributions**

Contribution ID: 1

Type: **not specified**

## **B. Genre – Phase prompte et émission rémanente précoce en optique et infrarouge proche**

*Thursday, 23 September 2010 11:45 (30 minutes)*

Je ferai une revue des résultats marquants concernant la phase prompte et l'émission rémanente précoce vues en optique et infrarouge proche depuis le lancement de Swift.

Contribution ID: 2

Type: **not specified**

## **R. Wijers – Review on radio observations of Gamma-Ray Bursts**

*Thursday, 23 September 2010 12:15 (30 minutes)*

Contribution ID: 5

Type: **not specified**

## **E. Le Floch – Galaxies hôtes, SFR**

*Friday, 24 September 2010 09:30 (30 minutes)*

Contribution ID: 6

Type: **not specified**

## **H. Flores – Observations des sursauts gamma avec X-Shooter et contraintes sur les progéniteurs (présenté par S. Vergani ci-après)**

*Friday, 24 September 2010 10:00 (30 minutes)*

Contribution ID: 8

Type: **not specified**

## T. Regimbau – Détection en coïncidence ondes gravitationnelles / sursauts gamma

*Friday, 24 September 2010 14:00 (30 minutes)*

Les détecteurs interférométriques d'ondes gravitationnelles de première génération ont atteint leur sensibilité nominale, permettant une recherche en coïncidence de supernovae, coalescences de binaires compactes et soft gamma repeaters; avec les détecteurs de sursauts gamma. L'observation simultanée du signal gravitationnel et gamma permettrait non seulement de confirmer une détection, mais aussi de mieux comprendre les différents mécanismes d'émission et de contraindre les paramètres des sources.

La synergie onde gravitationnelle / sursauts gamma prendra une toute autre dimension avec les détecteurs de troisième génération quand il sera possible d'utiliser des sirènes standards gravitationnelles pour tester le modèle concordant en cosmologie. Le détecteur européen Einstein Telescope (prévu pour 2020) devrait détecter plusieurs centaines de binaires compactes par an, en coïncidence avec des sursauts gamma courts a spectre durs. Alors que l'observation gravitationnelle fournit une mesure de la distance luminosité, la galaxie hôte du sursaut peut être utilisée pour mesurer le redshift. En ajustant la population observée a un modèle cosmologique, il sera alors possible de contraindre les paramètres de l'équation d'état de l'énergie noire.

Dans cet expose, je passerai en revue les différents mécanismes d'émission, puis je présenterai les détecteurs d'ondes gravitationnels actuels et futurs, les premiers résultats obtenus avec Virgo/LIGO et les prédictions pour les prochaines générations de détecteurs.

Contribution ID: 9

Type: **not specified**

## **F. Daigne – Revue des modèles**

*Thursday, 23 September 2010 14:30 (30 minutes)*

Contribution ID: 11

Type: **not specified**

## **V. Pelassa (contribution) – Uncovering the low-energy spectra of LAT transients**

*Thursday, 23 September 2010 15:00 (20 minutes)*

The standard analysis of data from the Large Area Telescope (LAT) is based on the full reconstruction and classification of events. The resulting spectra are yet restricted to energies greater than 100 MeV.

Using a loosened event selection allows to recover the photon statistics between 30 MeV and 100 MeV, and increases our sensitivity to Gamma-Ray Bursts and other transient sources. This talk will present the performances of this method for detection and spectral analysis.



Contribution ID: 12

Type: **not specified**

## **R. Hascoet (contribution) – Do Fermi-LAT observations really imply very large Lorentz factors in GRB outflows ?**

*Thursday, 23 September 2010 15:20 (20 minutes)*

Recent detections of GeV photons in a few GRBs by Fermi-LAT have led to strong constraints on the bulk Lorentz factor in GRB outflows. To avoid a large gamma-gamma optical depth, minimum values of the Lorentz factor are estimated to be as high as 800-1200 in some bursts. Here we present a detailed calculation of gamma-gamma optical depth taking into account both the geometry and the dynamics of the jet. In the framework of the internal shock model, we compute lightcurves at different energy and the corresponding spectrum and we show how the limits on the Lorentz factor could be lowered by a factor of 2-3 compared to previous estimates.

Contribution ID: 13

Type: **not specified**

## **Z. Bosnjak (contribution) – Gamma-ray burst spectral evolution in the internal shock model: confrontation with Fermi observations**

*Thursday, 23 September 2010 16:30 (20 minutes)*

Using a time-dependent numerical model where the prompt gamma-ray burst emission is calculated in the framework of the internal shock model on a broad energy range (from soft X-ray to GeV energies), we compute gamma ray burst lightcurves and time-evolving spectra. We show how the spectral evolution in this model is determined by the evolution of the physical conditions in the shocked regions and by the dominant radiative process for the effective microphysics parameters. The predictions of the model are confronted with the observations in the standard sub-MeV energy range, as well as with high energy bands observed by Fermi/LAT. In the soft gamma-ray range we considered the evolution of the pulse shape in different energy channels and the empirical hardness-intensity and hardness-fluence correlations; the scenario where the soft gamma-ray component is due to synchrotron radiation from shock accelerated electrons gives the best agreement with observations. In this scenario a variable inverse Compton component is expected at high energies (>100 MeV). We examine the effect of this component on the observed light curve and spectral properties. In particular, we investigate if the properties of Fermi LAT observations (the delayed onset of high energy component, its prolonged duration with respect to GBM emission) can be accommodated within our model.

Contribution ID: 14

Type: **not specified**

**R. Mochkovitch (contribution) – Do flares in the early X-ray afterglow really imply a late activity of the central engine?**

*Thursday, 23 September 2010 16:50 (20 minutes)*

Contribution ID: 15

Type: **not specified**

## **P. Roming (contribution) – Le projet JANUS**

*Thursday, 23 September 2010 15:40 (20 minutes)*

Contribution ID: 17

Type: **not specified**

## **Introduction à l'atelier**

*Thursday, 23 September 2010 11:00 (15 minutes)*

Contribution ID: 20

Type: **not specified**

## **S. Vergani (contribution) – GRB with X-Shooter: first results**

*Friday, 24 September 2010 11:00 (20 minutes)*

Contribution ID: 29

Type: **not specified**

## **A. Klotz (contribution) – Recherche des contreparties optiques des déclenchements ondes gravitationnelles et neutrinos**

*Friday, 24 September 2010 11:40 (20 minutes)*

Contribution ID: 31

Type: **not specified**

## **D. Goetz (contribution) – A detailed spectral study of GRB 041219A and its host galaxy**

*Thursday, 23 September 2010 17:10 (20 minutes)*

GRB041219A is one of the longest and brightest Gamma-Ray Bursts (GRB) ever observed. It was discovered by the INTEGRAL satellite, and thanks to a precursor intervening about 300 s before the bulk of the burst, ground based telescopes were able to catch the rarely-observed prompt emission in the optical and in the near infrared bands.

After a detailed analysis of its prompt gamma-ray emission, as observed with IBIS and SPI on board INTEGRAL, and of the available X-ray afterglow data collected by XRT on board Swift, we present the multi-band near infrared imaging data, collected at the TNG, and the CFHT, that allowed us to identify the host galaxy of the GRB as a nearby, underluminous, irregular galaxy of  $5 \times 10^9$  solar masses at redshift  $z=0.31$ .

Thanks to this distance measurement, we interpret the broad-band prompt optical to gamma-ray emission of the GRB, within the internal shock, and the reverse shock model. We were able to reproduce the GRB light curves and spectra by computing the emission by relativistic electrons accelerated by successive propagating shock waves within the relativistic flow.



Contribution ID: 33

Type: **not specified**

## **J.-L. Atteia (contribution) – Recherche d’une émission de corps noir thermique dans les sursauts gamma détectés par HETE-2**

*Thursday, 23 September 2010 17:30 (20 minutes)*

Contribution ID: **38**

Type: **not specified**

## **B. Cordier – La mission SVOM**

*Friday, 24 September 2010 14:30 (30 minutes)*

Contribution ID: 41

Type: **not specified**

## **S. Basa (contribution) – Le suivi des GRBs à l'ère de SVOM**

*Friday, 24 September 2010 15:00 (20 minutes)*

Contribution ID: 42

Type: **not specified**

## **S. Guiriec – Overview of GRB observations with the Fermi Gamma-Ray Space Telescope (on behalf of the Fermi Collaborations)**

*Thursday, 23 September 2010 11:15 (30 minutes)*

Je presenterai les observations des sursauts gamma avec le Gamma-ray Burst Monitor (GBM) et le Large Area Telescope (LAT), les deux instruments a bord du Fermi Gamma-Ray Space Telescope en activite depuis 2 ans. Je passerai en revue les resultats principaux de la collaboration Fermi comme la presence de composantes additionnelles a la fonction de Band standard dans les GRBs courts et longs, la presence de breaks a haute energie, l'emission retardee a haute energie, ainsi que les mesures derivees comme les contraintes sur l'invariance de Lorentz.

Contribution ID: 43

Type: **not specified**

## **P. Petitjean – Revue des résultats de spectroscopie haute résolution**

*Friday, 24 September 2010 09:00 (30 minutes)*

I will review results obtained recently from intermediate and high spectral resolution observations of GRB afterglows. These observations make it possible to study the interaction of the GRB emission with the surrounding gas but also the physical state of the ISM of high- $z$  galaxies in addition to the intervening absorbers detected along the line of sight to the GRB afterglow.

Contribution ID: 44

Type: **not specified**

## **M. Lemoine – Rayons cosmiques de ultra-haute energie et sursauts gamma**

*Friday, 24 September 2010 13:30 (30 minutes)*

Cette contribution discutera la production de rayons cosmiques de tres haute energie et de neutrinos de haute energie par les sursauts gamma, en faisant le lien avec les derniers resultats de l'Observatoire Pierre Auger en particulier.

Contribution ID: 45

Type: **not specified**

## **C. Kanaan (contribution) – La distribution de l'énergie isotrope des sursauts gamma révisée: émission isotrope**

*Friday, 24 September 2010 11:20 (20 minutes)*

Contribution ID: 46

Type: **not specified**

## Relevé de conclusions

*Friday, 24 September 2010 15:50 (1h 10m)*