



## Guest Investigator Final Report

*Project Title:* **Investigation of UV radiation of solar flares with LYRA**

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*Date of visit:* From: 01/2010                      to: 01/2010

*Project Abstract:*

This proposal is in reply to the second call for ideas for the PROBA2 Guest Investigator Programme. Its main scientific objective is to characterise the UV radiation of solar flares with the LYRA instrument. This study would constitute a follow-up of, and improvement on, our work on the radiative properties of solar flares in UV, EUV, and X-rays. We aim to characterise the appearance and behaviour of solar flares in L-alpha, as well as in other wavelengths (UV, EUV, X-rays), and explore the flare energetics and their spatial and temporal evolutions.

*Primary ROB Contact(s):* Marie Dominique

*Which Instrument(s) was/were used:* SWAP & LYRA

*Were other instruments used in collaboration with PROBA2?*

No

*(Optional) Description of collaboration:*

SDO, SWAP, RHESSI and GOES, to study the energetics of impulsive and decay phases of a large population of well-observed flares.

*Was there a dedicated observing campaign performed or planned?*

No

*(Optional) Description of campaign:*

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*Brief Description of work performed during the visit:*

Used archival and new LYRA data, along with SWAP, RHESSI and GOES, to study the energetics of impulsive and decay phases of a large population of well-observed flares. This allowed us to progress understanding of a number of topics, including: - The relative heating contribution of electrons, and the cooling contribution of L-alpha during both the impulsive and gradual phases; - The importance of L-alpha cooling of the chromosphere in large and small flares; - The relationship between L-alpha

emission and the electron spectral parameters in large and small flares (which in turn predicts the depth to which the chromosphere can be heated, in the collisional thick target model). This may provide a new test of the standard flare model. - The structure of the chromosphere and its temporal evolution during flare emission, and the power radiated in hydrogen lines, as inferred from the comparison between the results of our theoretical models and the L-alpha observations.

*Future Plans:*

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*Has this work been published?*

Unknown

*If so, Where? Reference/DOI? ADS Link?*

*Please add below any other comments you might have:*