

Some aspects of GAIA observations of AGB and post-AGB variables

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Some scientific objectives for evolved variables

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 - More evolved AGB stars (intrinsic)
 - Mira variables
- R CrB variables and related objects
 - post-AGB stars
 - Maximum light: Amplitude of a few tenths of mag.,
Period between about 40 and 100 days
 - Erratic brightness declines: Amplitude up to 8 mag.,
Timescale \sim months

Short-term brightness variations of Miras

- Hipparcos detections (de Laverny et al., 1998):
 - More than 50 events detected
 - Amplitude from $H=0.23$ to 1.11 mag.
 - Duration from about 2 hours to about 6 days

Short-term brightness variations of Miras

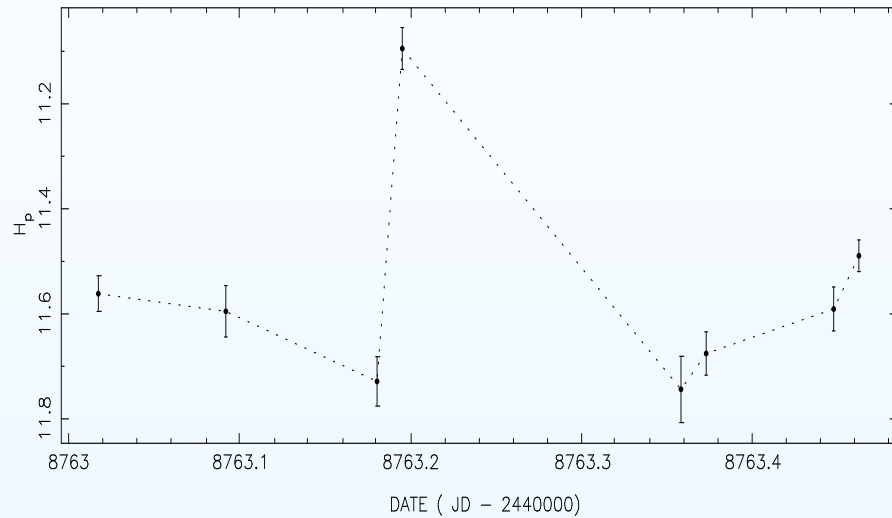
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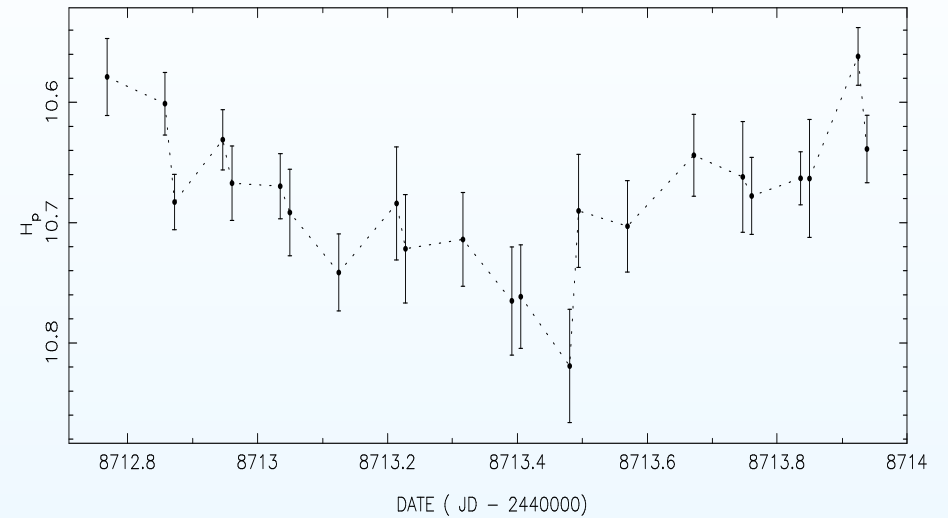
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- Cause of these events: interaction of the Miras wind with a low-mass companion (Struck et al., 2002)?

Rapid brightness variations of Miras: some examples

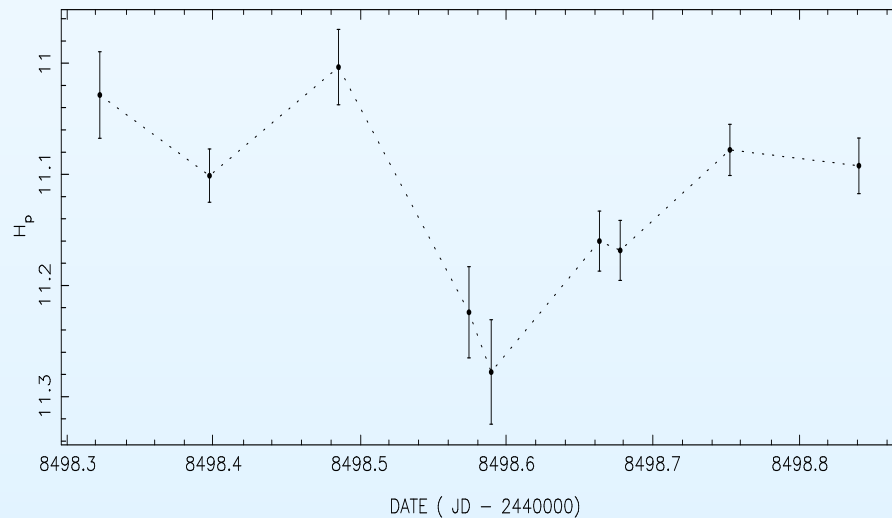
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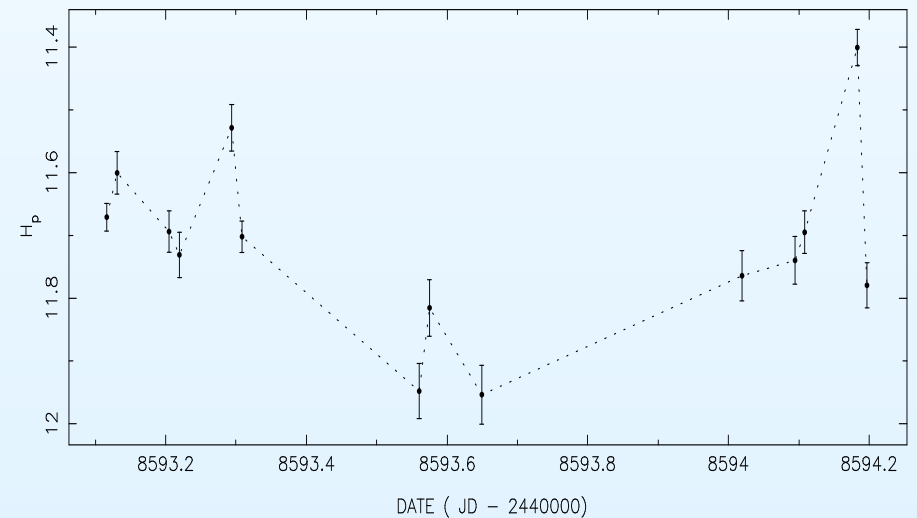
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- First multicolour and spectroscopic observations:
 - What are they?
 - Why do they occur?
 - Science alerts to the ground?
 - Similar events for other types of variables (M giants,...)

Carbon Miras and GAIA

- Very interesting targets:
 - Fundamental role in the chemical evolution of galaxies
 - Easily identified with colours and/or spectra
 - Very bright: GAIA will lead to a census of these stars in the Local Group
 - Population, spatial distribution, star formation history studies,...

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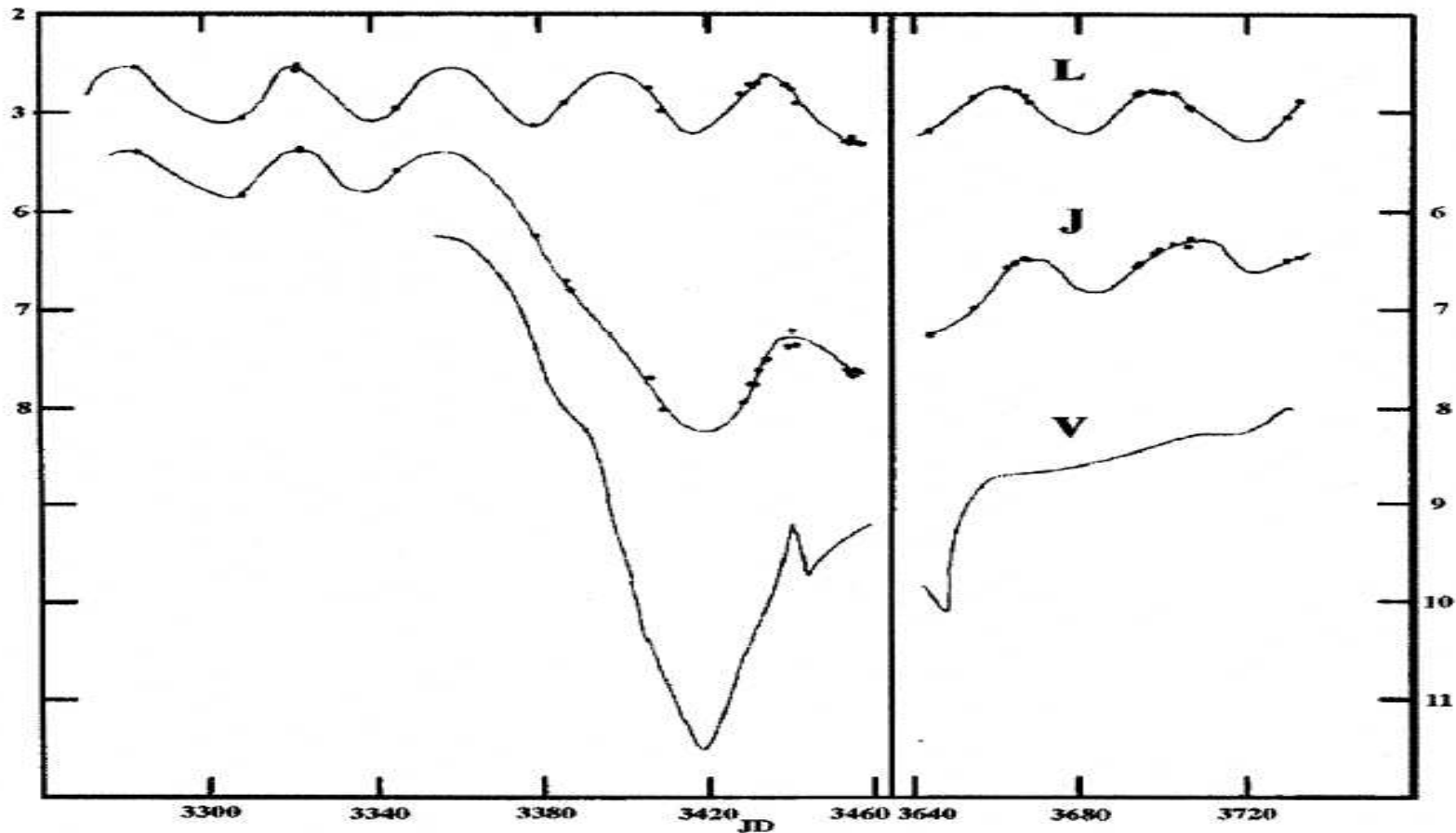
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- Proposed as stellar candles ... but variables
 - Need to study their light-curve in several colours
 - Pulsation mode versus luminosity?
 - Confirmation or not of their “candle status”

R Coronae Borealis variables and GAIA

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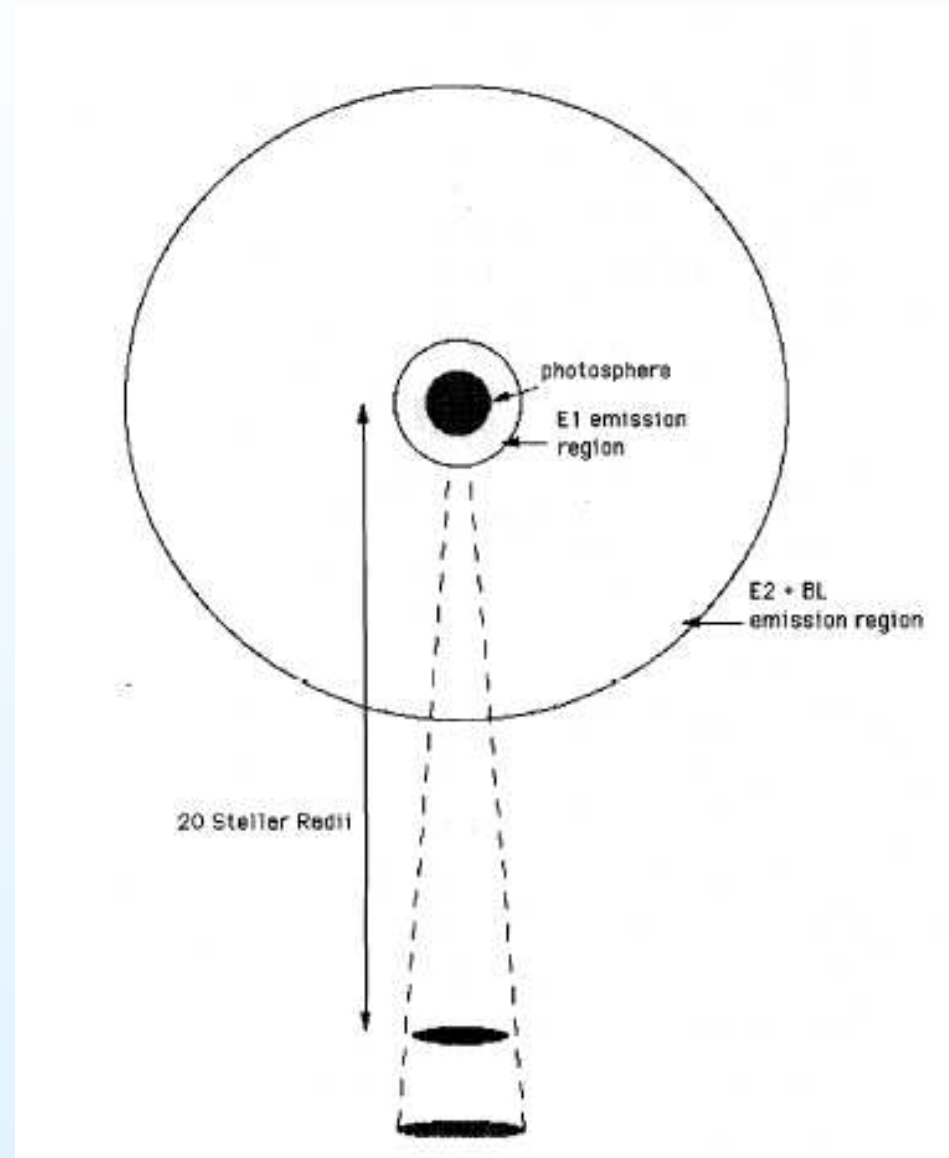
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- GAIA: New discovered R CrB variables in the Local Group with known distances
 - Confirmation of a suspected $T_{\text{eff}}-M_V$ relation
 - Classify these stars and position in the CMD
 - Understanding their evolutionary status
 - Do not forget related variables (Sakurai's object,...)