BRITE - Constellation

Werner W. Weiss
&
BRITE-Constellation Team
Why BRITE?

- high precision photometry of bright stars
  - ‘bright stars’ < 4 mag; goal < 7 mag
  - very difficult to achieve from ground
BRITE - HRD

Star-Type from VISAT
- Ap (22)
- β Ceph (29)
- δ Sct (7)
- OB (62)
- PMS (1)
- Mira (1)
- roAP (1)
- SPB (3)
- γ Dor cand. (3)
- RR Lyrae (3)
- HgMn (7)
- Wolf Rayet (1)
- Ecl. Binaries (12)

Total 534 stars with V < 4

Temperature

Log T_eff
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- two nanosats -
  - two colors:
    - Red and Blue filter
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- 24° x 20° fov: simultaneously 2 to 18 bright stars, up to 200 stars mag < 7
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  - two colors:
    - Red and Blue filter
- 24° x 20° fov: simultaneously 2 to 18 bright stars
- “full” sky access including polar region
  (... limits depend on the critical angle to the sun)
BRITE Assets

- Data strings can span more than one year.
  - $+80^\circ > \text{DE} > -80^\circ$: $\sim 180 - 200 \text{d}$ continuous coverage per year
  - polar regions: up to 300d
  - 1 to 40 data points per orbit ($P_o \sim 100 \text{ min}$)
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- Ground based spectroscopy with high spectral & time resolution relatively easy to achieve
  - Spectroscopic network of 1 to 2 m class telescopes
    Participants are welcome (please see me)!!
BRITE Basics

- 20cm cubes with < 7kg
BRITE Basics

20cm cubes with < 7kg

Pre-deployed antennas and booms
BRITE Basics

20cm cubes with < 7kg

Pre-deployed antennas and booms

Telescope (Blue and Red):

- 11 Megapixel CCD
- Aperture = 3cm
- FOV = 24°
Camera
KODAK KA11002

good performance at high (+20C) temperatures and...
Reaction Wheels
sections:
- \( R_{nnnB1-4} \) ... backgrounds
- \( R_{nnnA1-2} \) ... apertures

processed data:
for each background median and sigma are calculated
+ the sum of signals values encompassed in the two apertures

a total of 10 values
BRITE Status Summary

- development of the hardware underway
- completions of both satellites mid-2009
- launch expected for 4Q/2009 or 1Q/2010
BRITE-Constellation consists of UniBRITE and BRITE-AUSTRIA (TUG-SAT1), two 20 cm cube nanosatellites. Each will fly a small aperture telescope with a CCD camera to perform high-precision two-color photometry of the brightest stars in the sky (≤ 4th mag) continuously for up to several years. The primary science goals are studies of massive and luminous stars in our neighbourhood, representing objects which dominate the ecology of our Universe, and also evolved stars (giants) to probe the future development of our Sun. The wide field cameras (24°) will also obtain data from other scientifically interesting stars to investigate their stellar structure and evolution. All of that is enabled by innovative technology currently developed in collaboration between Canada and Austria. A launch of UniBRITE and BRITE-AUSTRIA in early 2009 is envisioned. An expansion proposal of the
BRITE Team

CANADA

● Science
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      * PI BRITE
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    ■ a.o.
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    ▶ Ceravolo Optics

AUSTRIA

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    ■ P. Schotter
  ▶ TU Vienna
CoRoT & KEPLER

Bright stars
Two colors
All sky
Why the efforts?

http://www.brite-constellation.at/
WHAT DO NANO-SATS AND MEGA-SATS HAVE IN COMMON?

GOOD VIBRATIONS...!
THANK YOU