Smart Panoramic Optical Sensor

DPU & Software

DPU & Camera head Interface

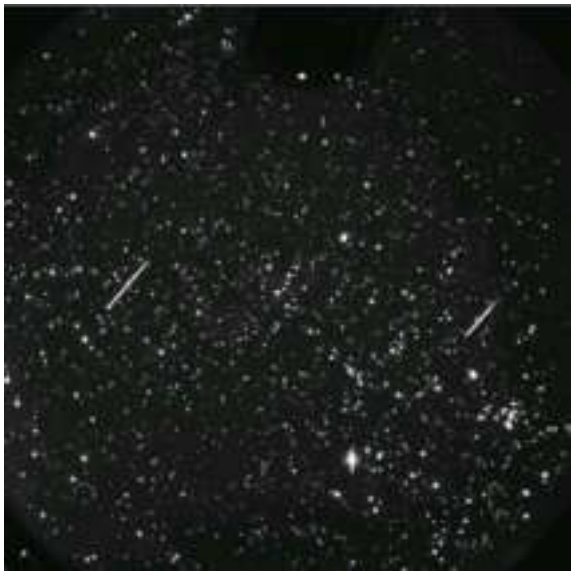
DPU (evaluation board):
- Leon2 (SPARC) processor running in Xilinx XC2V3000 FPGA
- 70 MHz core clock
- 8 Mbyte flash prom (2M x 32)
- 1 Mbyte static ram (256K x 32)
- 64 Mbyte PC133 SDRAM (16M x 32)
- Ethernet PHY 10/100 Mbit transeiver
- Standard RS-232 interfaces
- 120-pins memory and custom I/O expansion connectors JTAG and slave-serial FPGA programming capability
- LEON-FT version available

Camera Head interface:
- Dual image buffer 2x2MByte
- Serial command & data interface max. 15 MPixel per second
- LVDS signal levels

Electronic box:
- Power input 12V (designed for car adaptor)
- Integrated power supply for Camera & notebook
- EMC designed

SPS Electronic Box with DPU, Camera head interface and Power supply

SPS software support & science support



Test at Zeiss-Planetarium Jena

Onboard software (plain camera mode):
- Continuous imaging (windowing and binnig support)
- Send data over TCP/IP as formatted FITS images

Onboard software (SPS mode):
- Continuous imaging (windowing and binnig support)
- Meteor detection ~1 MPixel/sec
- Typical imaging rates 1024x1024 @ 0.5 fps, 512x512 @ 2 fps, 256x256 @ 8 fps
- Only detected events are sent via telemetry
- Camera head control and detection parameters by telecommands
- 32 MByte telemetry buffer, 16 MByte imaging buffer
- Optional snapshot and overlayed image transfer

Spacecraft simulator software:
- Software simulator for typical spacecraft interface over UDP/IP protocol
- Onboard time, housekeeping and telemetry services

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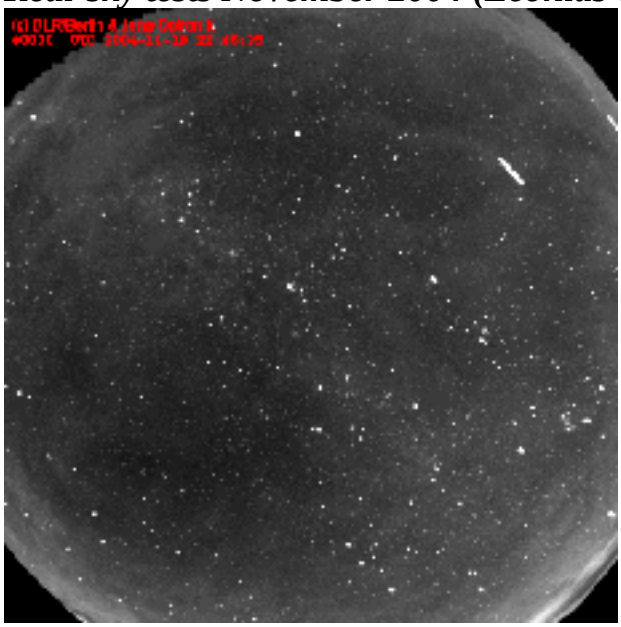
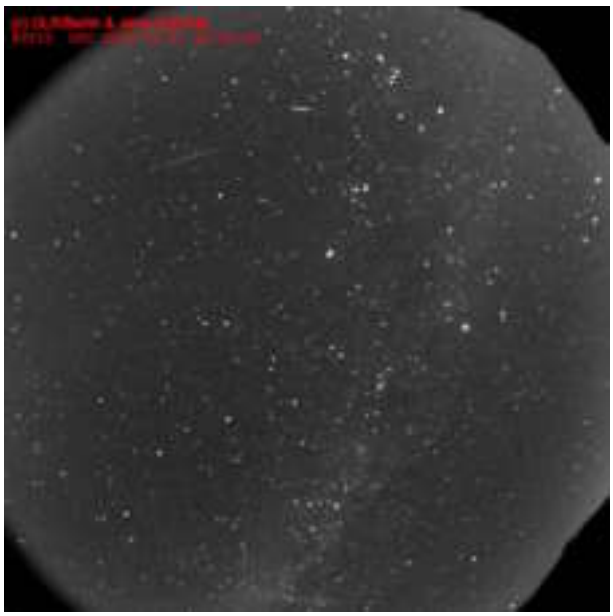
Real-sky tests November 2004 (Leonids & Geminids)



Full sky image during Leonids, stars of magnitude +6 are visible (the long object is an airplane)

Instrument at lake Sobot/Austria during Leonids, November 2004

Geminids fireball, Tenerife, December 2004



Two meteors in a single image (1.6 sec exposure time) during Leonids, Tenerife, November 2004

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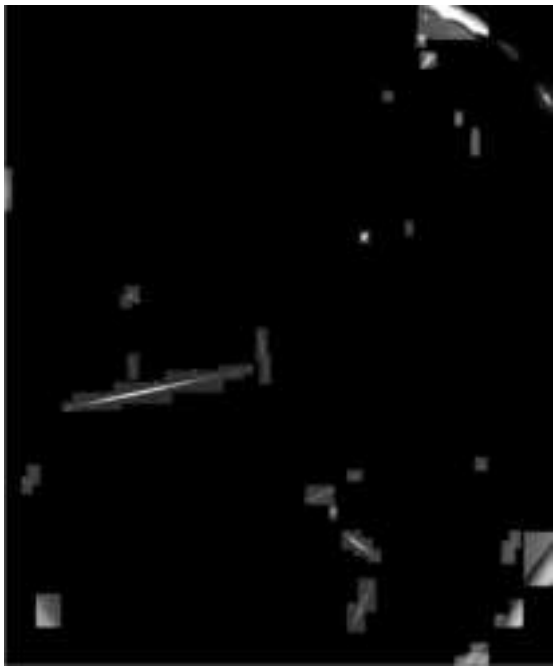
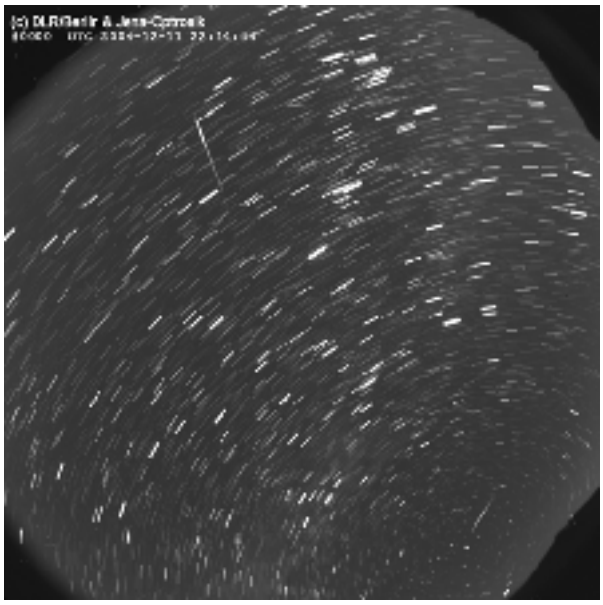
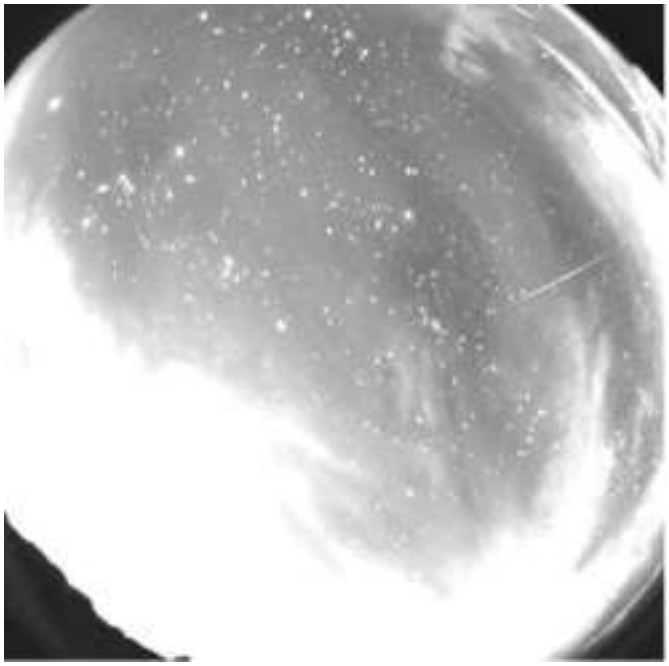
DPU & Software



Meteor detection summary image



Overlayed summary image



A single meteor detected in 5 consecutive images (4-5 seconds)

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