

MEX – TGO Cooperation

HRSC - CaSSIS



DLR

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- **Prepare global HRSC 50 mosaic as base layer for TGO/CaSSIS target database (CaST)**
 - *Technical support of MEX for TGO.*
- **User HRSC as a predictor for interesting CaSSIS science**
 - Put targets into CaST (=the target data base for CaSSIS) on the basis of previous HRSC imaging (i.e., places that we already identified as being interesting)
 - *Science objective 1: Optimize science return from TGO/CaSSIS through more efficient use of resources (time, data volume)*

- **Comparison between HRSC and CaSSIS**
 - HRSC started in 2004, so we can extend a 14 year time series. Suggestion: Use “MUTED” database and identify regions where HRSC (and THEMIS, CTX) have many observations over different years and seasons. These regions should be regularly observed by HRSC and CaSSIS to detect surface changes.
 - *Science objective II: Long-term colour and photometric changes (dust, frost)*
 - *Science objective III: Topographic changes (less likely, but who knows?)*

- **Integrate HRSC DEM (or even DEM mosaics) in processing scheme for CaSSIS DEM**
 - *Technical support of MEX for TGO (optimized CaSSIS DEM).*
 - Construct joint HRSC-CaSSIS DEM (CaSSIS where available, gaps filled with HRSC, or MOLA where no HRSC is available)
 - *Science objective VIII: → best regional topographic knowledge of key locations on Mars → improved quantification of surface processes*

- **Joint observations between HRSC and CaSSIS (and HiRISE?)**
 - Observe same area at the same time, but with different geometry (phase angle)
 - *Scientific objective IV: Valuable data for photometric analysis (surface properties)*
 - *Scientific objective V: Cross-calibration (improved science return)*
 - Observe same area at different, but closely spaced times
 - For example, observe morning fog in depressions such as Valles Marineris and check then later at, e.g. 10 am local time, whether the fog has already disappeared.
 - Difficult due to mission (planning cycles), s/c, and instrument constraints, needs careful and long-time preparation, but may be worth the effort
 - *Science objective VI: Diurnal cycles of atmospheric properties (e.g., water vapour)*
 - Joint limb observations (details, e.g., time and geometry, tbd)
 - *Should be coordinated with NOMAD (and ACS?)*
 - *Science objective VII: improved knowledge of atmospheric structure*

Observe possible source areas for trace gases

- **Instantaneous release**

- Possible condensates (ices)?
- Would require very fast reaction times (is that possible with ESAC/ESOC?)
- Not likely (Pla-Garcia talk Wed afternoon)

- **Continuous release**

- What would we expect?
- Fractures, pits, else?
- How precisely can NOMAD and/or ACS constrain the release location (diameter?)
- HRSC may be effective (larger coverage than CaSSIS)