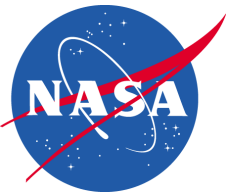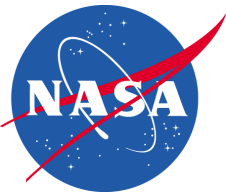# Review of Models:
ITRF2008 vs. ITRF2013

IDS Analysis Working Group Meeting

Paris, FRANCE
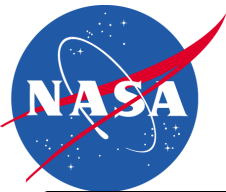
March 26-27, 2014

Measurement Models

1. **Correction of a priori frequency for some stations, through improved estimation of bias parameters. → Removes spurious signatures in scale, post-2002 (2002-2012).**

2. **Implementation of Alcatel and Starec antenna phase laws by almost all AC's (5/6). → Is neutral or improves RMS of fit; Shift in scale that appears correlate with no. of Starec antenna.**

3. **Use new SAA models to correct SPOT-5 data (> 2006).**
   --> Reduces error in positioning for SAA stations, in particular Cacheoira Paulista (Brazil).

4. **Troposphere modelling:**
   A. All ACs have upgraded to at least GMF/GPT;
   B. Some ACs use VMF1.
   C. Some ACs have implemented estimation of troposphere gradients.

Force Models

1. **Geopotential: e.g. EIGEN6S2, vs. GOCO02s + time-varying coefficients from SLR DORIS.** **Use of new GRACE(+GOCE)-derived geopotential models provides better modelling of static and time variable gravity, important for LEO satellites.**

2. **Ocean Tides: e.g. FES2012, EOT11a, GOT4.8.** **Improvements in dynamical ocean tide modelling & ocean loading.**

3. **Nonconservative force models:**
   --> Behaviour of each center's models vetted through intercomparison of empirical accelerations which allowed identification of model problems (values or implementation).
   → Satellite specific modelling: SPOT5 (pitch of solar array).
   → Implement & verify attitude laws for new satellites (Cryosat2, HY2A).
   → More frequent cd-adjustments during periods of high solar activity.

Other DORIS model changes

1. **Update in station coordinates: DPOD2008 (v12, v13) vs. previous incarnations or ITRf2008.**

2. **New DORIS data**
   - **Data reissued or corrected:**
     - → **Envisat (2002-2006; DORISMAIL 0823)**
     - → **SPOT-4 (1998-1999; DORISMAIL 0801)**
     - → **GR3B, GAVB (Cryosat2, Jason2; DORISMAIL 0750).**

3. **SAA-corrected data**
   - **SPOT-5 (from H. Capdeville).**
   - **Jason-1 (previously available).**

4. **New satellite data: Cryosat-2; HY-2A (loss of SPOT-2, Envisat, SPOT-4, in July 2009, April 2012, June 2013, respectively)**

4. **Many improvements/changes to software packages (GEODYN, GINS, NAPEOS, Bernese); IERS2010 and many other coding changes**