

Thoughts on the Diurnal/Semidiurnal EOP Model

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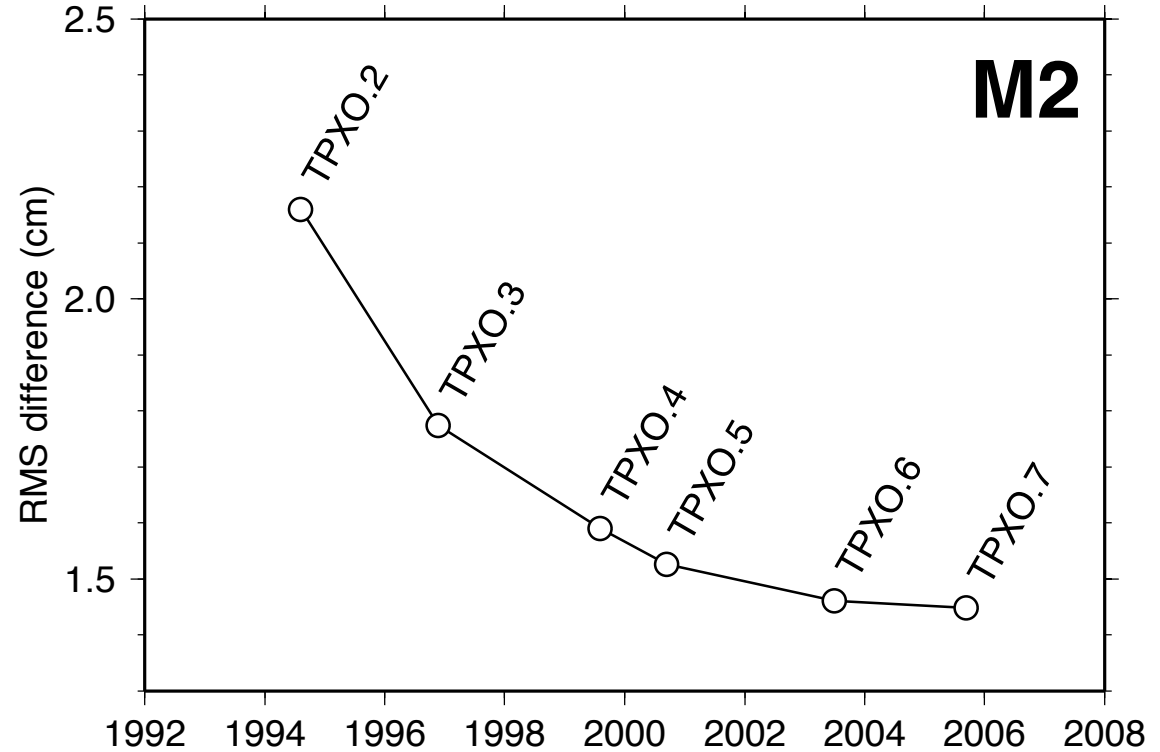
**Current (IERS'96) model: “Model C” from
Chao et al. (JGR, 1996), =
Global TPXO.2 model (Egbert et al., JGR, 1994) +
Arctic hydrodynamic model (Ray et al., JoG, 1997).**

Should IERS'96 tidal EOP model be updated?

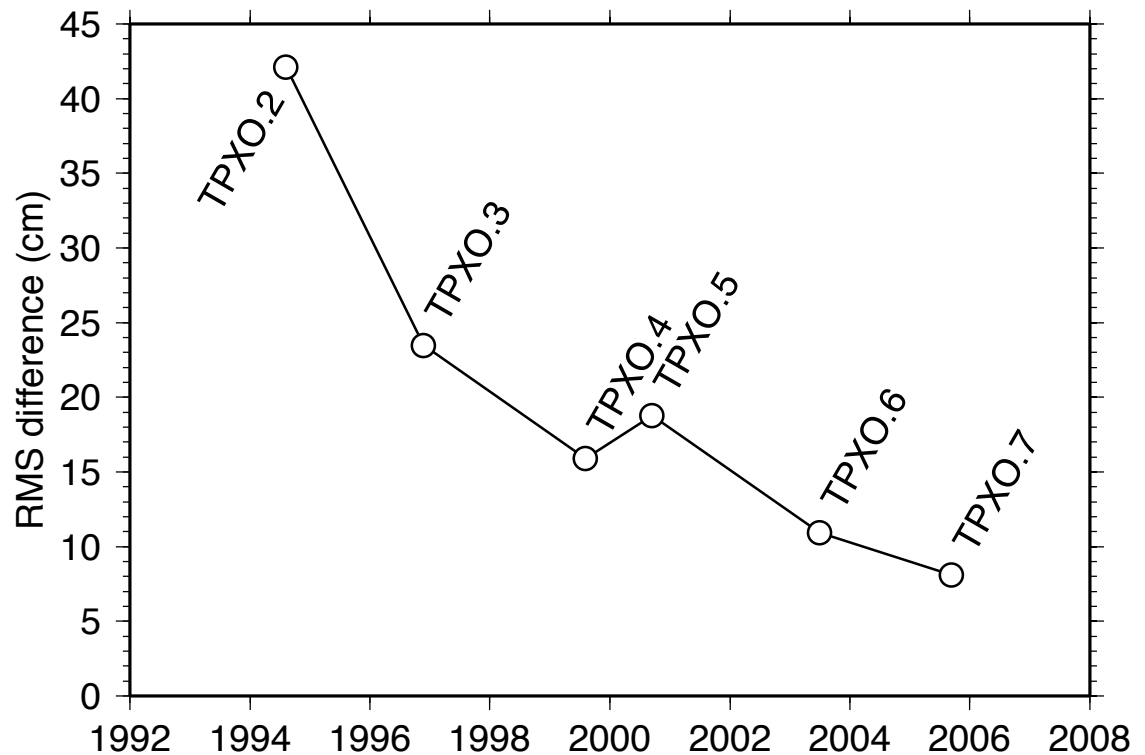
- **Current model was based on only ~1 year of Topex/Poseidon data. We now have ~15 years of T/P + Jason data, plus GFO and ERS data in higher latitudes.**
- **New global tidal models are much improved over the TPXO.2 model — at least for tidal elevations. (see next page)**
- **New models probably more accurate in Arctic & Antarctic Oceans (higher spatial resolution, better bathymetry).**
- **A tidal model for EOP also requires global current velocity, but...**
 - Few such models are available. — Recent examples: TPXO.7, GOT4.7**
- **Do new models better predict EOP?**
 - Hard to say. (see following)**
- **What about S1,S2 air-tide contributions? — De Viron et al (JGR, 2005) show large inconsistencies between air-tide models.**
- **Ocean response to S1 air tide is available from Ray & Egbert (JPO, 2004).**

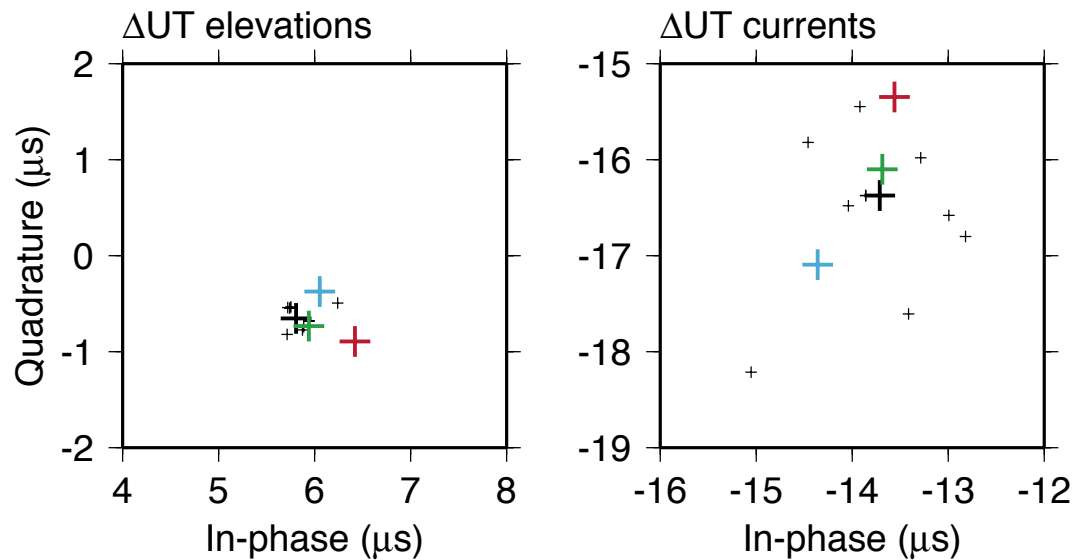
History of TPXO.*n* M2 global tide solutions

102 deep-water stations

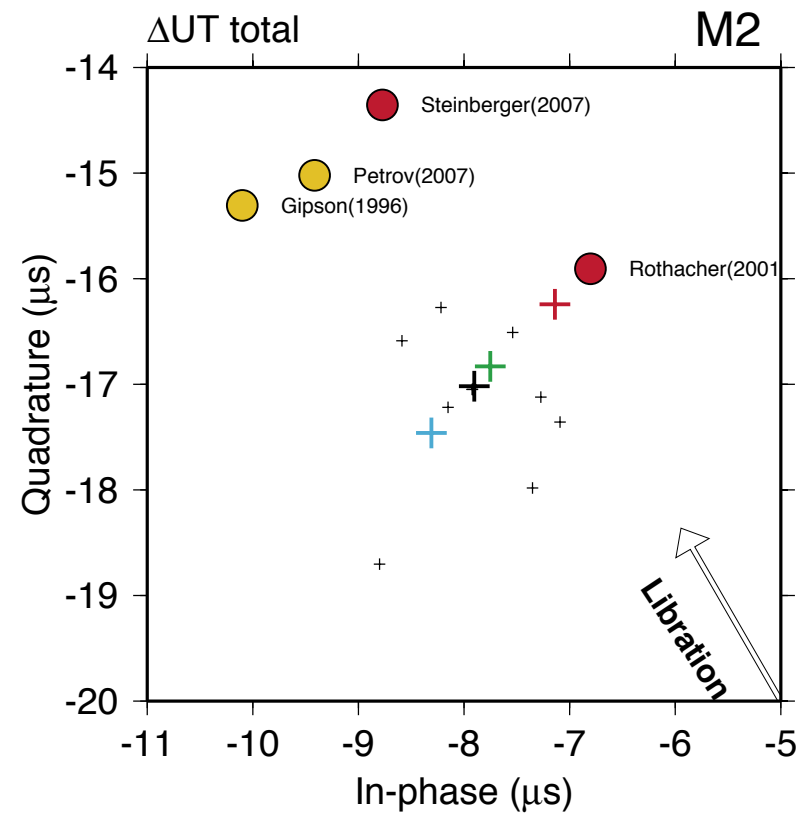


114 shallow-water stations
(not final set)

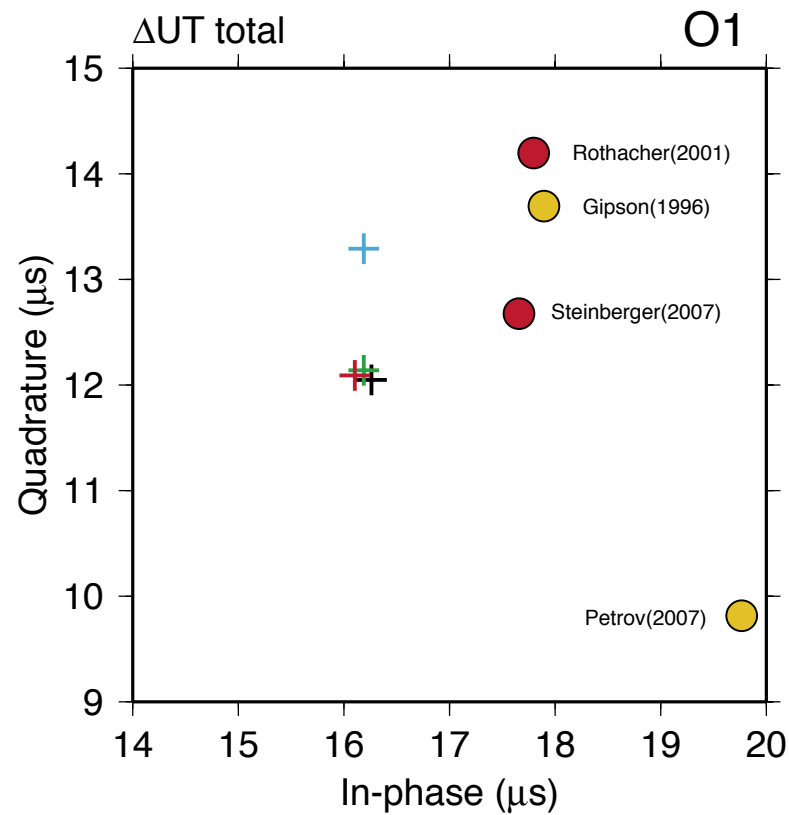
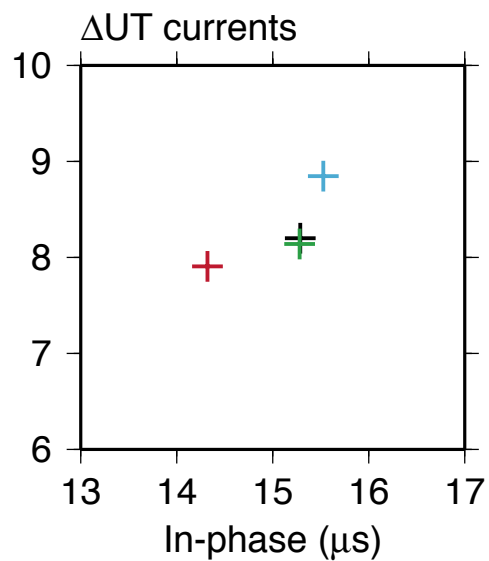
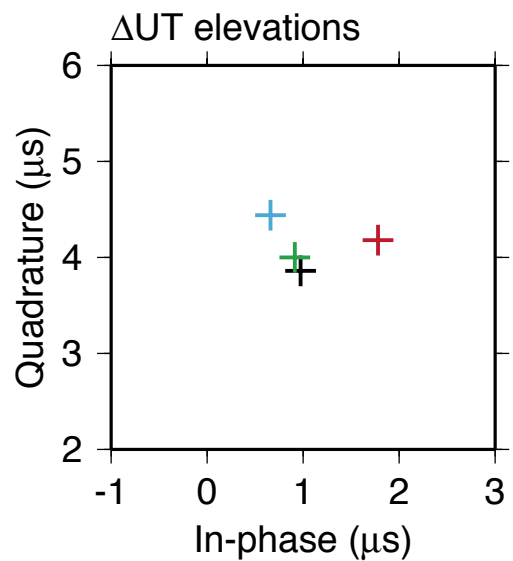




+ IERS(1996)
 + TPXO.6.2
 + TPXO.7
 + GOT4.7

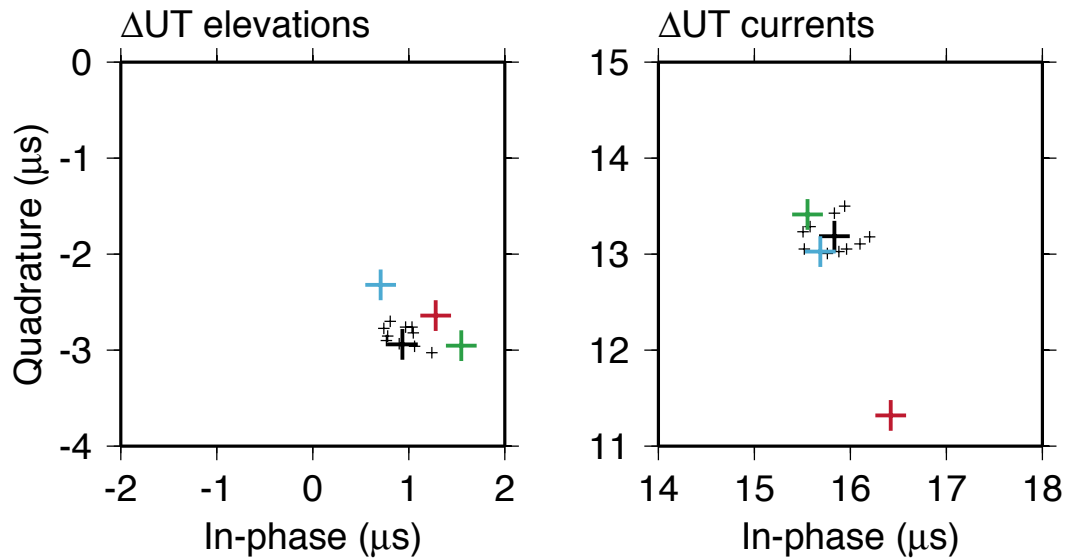


NOTE: New geodetic measurements $\approx$ ocean models + Libration

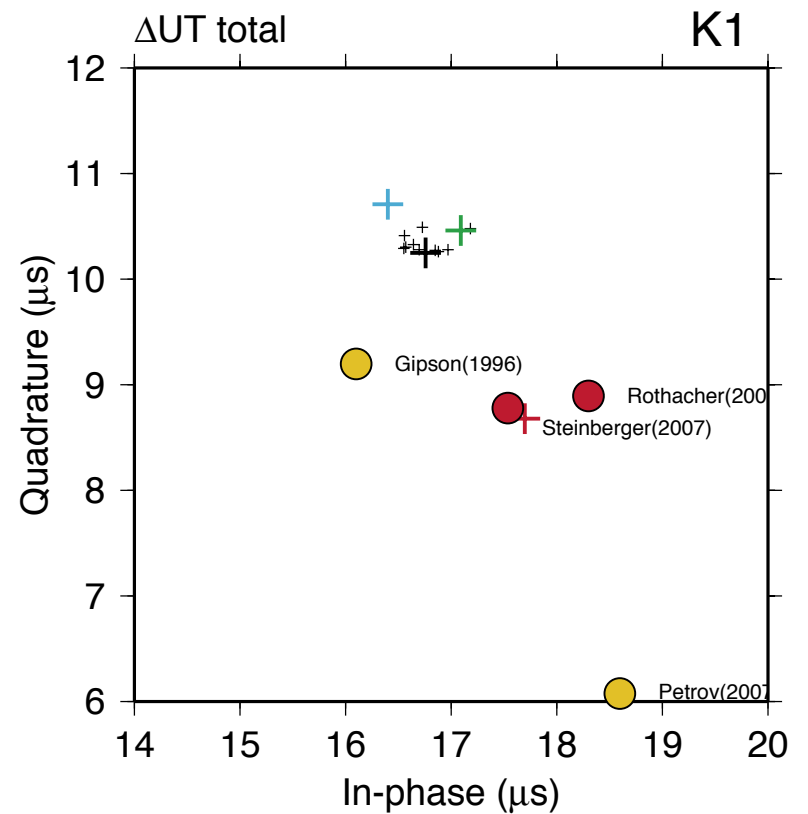


+ IERS(1996)
 + TPXO.6.2
 + TPXO.7
 + GOT4.7

	Amp (μ s)	Phase
Gipson	22.5	37.4°
Rothacher	22.8	38.6°
Steinberger	21.7	35.7°
Petrov	22.1	26.4°



+ IERS(1996)
+ TPXO.6.2
+ TPXO.7
+ GOT4.7



	Amp (μs)	Phase
Gipson	18.5	29.7°
Rothacher	20.3	25.9°
Steinberger	19.6	26.6°
Petrov	19.6	18.4°

Should IERS'96 tidal EOP model be updated?

Adopt an ocean-tide model (as now) or one of the geodetic estimates?

**Geodetic EOP estimates disagree among themselves and
with ocean models for O1, K1.**

M2 (both measured and modeled) appears satisfactory to within error bars.