

**PASSIVE COMPENSATION OF THERMAL EXPANSION/CONTRACTION**

- Thermal distortion of the spacecraft structure changes moment of inertia about spin axis, hence, at constant angular momentum, the spin rate. Effect can be compensated by suspending balance masses on rods that expand & contract in "counterphase" to spacecraft
- System can consist of high-CTE rod cantilevered (and thermally anchored) on the outer shell and connected to a parallel, low-CTE rod supporting a balance mass on its free end (upper panel). Configuration constraints lead to short rod lengths and large balance masses; moreover, large spin centrifugal force suggests to modify the scheme into that shown in middle panel
- Yet another configuration consists in two rods in triangular configuration supporting the balance mass (lower panel). Angle  $\alpha$  is constrained by considerations of friction angle and linearity. The rod's  $\Delta l$  is amplified by a factor of  $\approx 1/\sin\alpha \approx 6$ , allowing use of conventional Al alloy rods and small balance masses (on 4 positions around the cylinder)

