

## **Linear Polarization Issues for Laser Ranging to Uncoated Retro-Reflectors**

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As shown at the last laser workshop in Deggendorf 2011 (see [http://cddis.gsfc.nasa.gov/lw17/docs/presentations/session10/02-Kirchner\\_PolarizationEffect.pdf](http://cddis.gsfc.nasa.gov/lw17/docs/presentations/session10/02-Kirchner_PolarizationEffect.pdf)), a first test session to Compass-M1 showed some systematic dependence of measured ranges on the orientation of the linear polarization plane with respect to the satellites motion. The effect for this pass of this satellite was in the range of 1 mm and below.

We have checked now all available HEO satellites with UNCOATED retros; the effect can be seen on all of them; however, the difference can be up to about 5 mm – if the orientation of the laser polarization plane is along-track or across-track. Switching the laser to circular polarization instead of linear polarization – by inserting a simple  $\lambda/4$  plate at the laser table -removes this effect.