**Definition of CPL Optical Properties Flags**

**Table 8: Definitions of CPL Optical Properties Flags**

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| **Parameter** | **Interpretation** |
| Extinction\_QC\_Flag | -1=calculation not attempted 0 = non-opaque layer extinction analysis nominal |
|   |  1 = layer hit earth’s surface before layer bottom reached, adjusted bottom |
|   |  2 = lowering lidar ratio thru iteration process successful |
|   |  3 = raising lidar ratio thru iteration process successful 4 = # of iterations maxed out, analysis stopped 5 = signal inside layer saturated before bottom, analysis stopped 6 = layer is opaque, layer OD= -1, initial lidar ratio accepted 7 = layer is opaque, layer OD= -1, lidar ratio iteration successful 8 = layer OD out of bounds (invalid) OD= -999.9 9 = layer analysis invalid because final lidar ratio out of bounds |
| Lidar\_Ratio\_Selection\_Method | 0 = generic default |
|   | 1 = aerosol GEOS5 lookup table |
|   | 2 = cloud lookup table |
|   | 3 = 1064 lidar ratio used 532 OD (for ice clouds only)4 = constrained result using clear zone just below layer5 = constrained result with opaque layer6 = lowered lidar ratio by a max of 15sr to reach layer bottom7 = raised lidar ratio by a max of 15sr to reach layer bottom8 = open slot (not used)9 = missing |
| Constrained\_Lidar\_Ratio\_Flag | 0 = useful value using nominal “constrained’ procedure |
|   | 1 = useful value using opaque “constrained’ procedure |
|   | 2 = constrained lidar ratio outside thresholds3 = below layer clear zone too small4 = clear zone signal error > threshold5 = Tp\_sq < allowed min6 = Tp\_sq at or below 0.07 = useful 1064 lidar ratio using 532 OD (for ice clouds only)8 = Tp\_sq at or below 0.0 in opaque cloud conditions9 = missing  |