Modified Single-Layer Model Mapping Function

SLM mapping function:

$$F(z) = \frac{1}{\cos z'} \quad \text{with} \quad \sin z' = \frac{R}{R+H} \sin z$$

R and H are set typically to 6371 and 450 kilometers, respectively.

“Modified” SLM (MSLM) mapping function:

$$F(z) = \frac{1}{\cos z'} \quad \text{with} \quad \sin z' = \frac{R}{R+H} \sin(\alpha\, z)$$

Best fit with respect to the JPL extended slab model (ESM) mapping function is achieved at $H = 506.7$ km and $\alpha = 0.9782$ (when using $R = 6371$ km and assuming a maximum zenith distance of 80 degrees).