

# Authors' response to the comments of Eun-Su Yang on “MICRU background map and effective cloud fraction algorithms designed for UV/vis satellite instruments with large viewing angles” by Holger Sihler *et al.*

We would like to thank Eun-Su Yang for submitting a short comment (SC1) to our submission to AMTD.

For reference, the original comment below is typeset in black, our response in blue. Modifications of the original manuscript (green) are indicated in red.

The authors need to clarify definitions of relative azimuth angle (RAA) and scattering angle (SA). It seems as though the authors performed their CF calculations using correct RAA and SA in the paper; however, I noticed the definitions of RAA in Figure 1 and SA in Equation (7) do not agree with each other.

Suppose  $SZA = 30$ ,  $VZA = 60$ , and  $RAA = 180$  in Figure 1. Then, we can estimate  $SA = 90$  from Figure 1.

On the other hand, plugging the above  $SZA$ ,  $VZA$ , and  $RAA$  into Equation (7) gives:

$$SA = \arccos\{-\cos(VZA)\cos(SZA) + \sin(SZA)\sin(VZA)\cos(RAA)\}$$
$$= \arccos\{-\cos(60)\cos(30) + \sin(30)\sin(60)\cos(180)\} = 150.$$

Therefore, RAA in Figure 1 should be  $|VAA - (SAA - 180)|$  or  $|VAA - (SAA + 180)|$  instead of  $|VAA - SAA|$  where  $SAA$  is solar azimuth angle and  $VAA$  is viewing azimuth angle.

We thank Eun-Su Yang very much for pointing out this error. We double checked the SA definition in our calculations and they agree with Equation (7). Hence, we agree that the  $SAA$  is not correctly indicated Figure 1. We replaced Figure 1 with

