Reply to comments:

1. *The 'alpha * Rpol' part in Eq.(1), p.4, seems unclear to me. Please provide explicit form for the Rpol matrix like it is done for the RPV-part. Reference to the Maignan et al, 2009 paper gives little help:*
1) Sections 3.2, 3.3, and 3.5 in Maignan et al. 2009 discuss different models - which particular one was used in the paper under review? 2) As far as i know, Maignan et al. 2009 does not define the Mueller matrix of the surface - only BPDF, which is based on the F12=F21=Fp element of the Fresnel matrix. To get the Mueller matrix, shall one compute matrix exponential of the Fresnel matrix, or, vice versa, create a matrix of "scalar" exponents of elements of the Fresnel matrix? 3) The complete 4x4 (or reduced 3x3 if V is ignored) Mueller matrix of the surface is required only to simulate the surface reflection of diffuse radiation (including multiple bouncing of light between the atmosphere and surface). How strong and important is that effect for polarization components? 4) Is 'alpha' in Eq.(1) band-dependent?

   Response:
   We have added the expression (Eq.(2)) and the detailed description for $\mathbf{R}_{\mathrm{pol}}$ in the revised manuscript.