



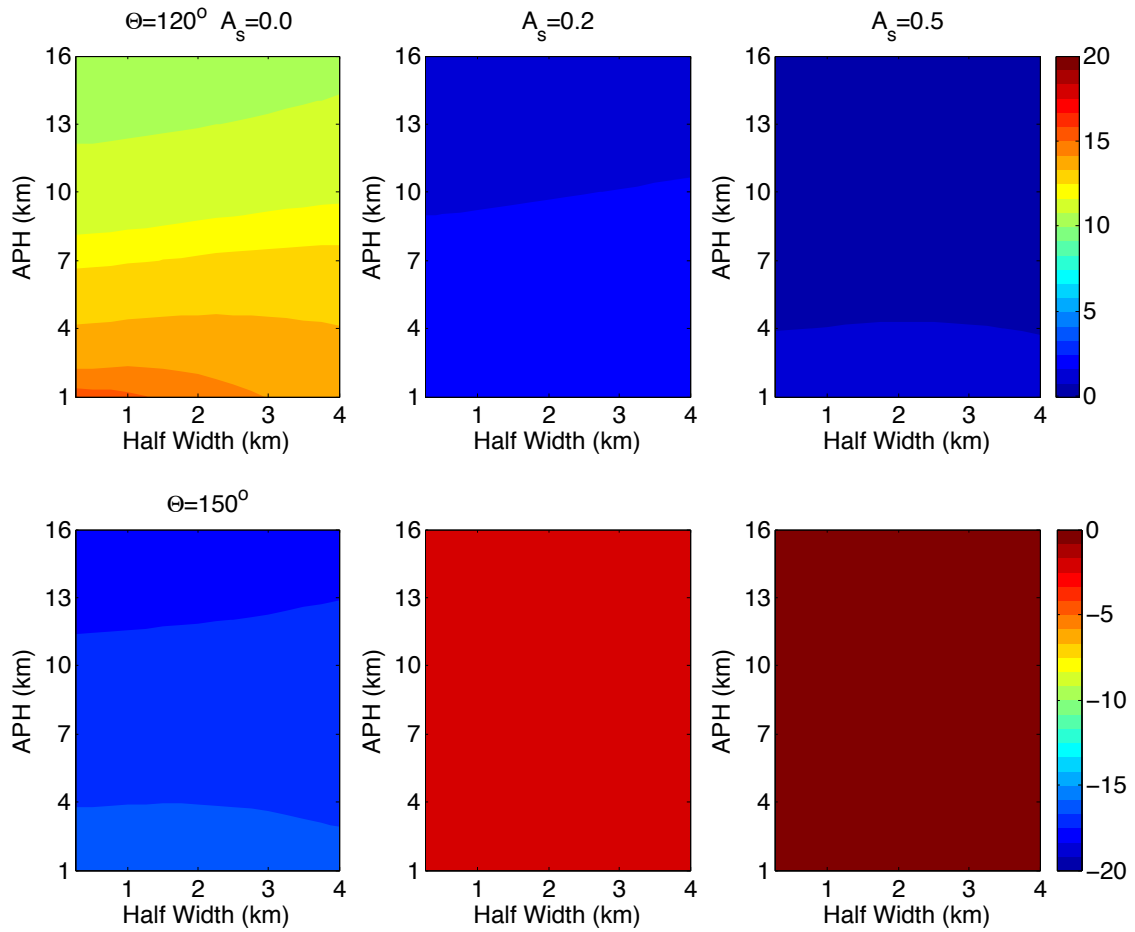
*Supplement of*

## **Polarimetric remote sensing in oxygen A and B bands: sensitivity study and information content analysis for vertical profile of aerosols**

**Shouguo Ding et al.**

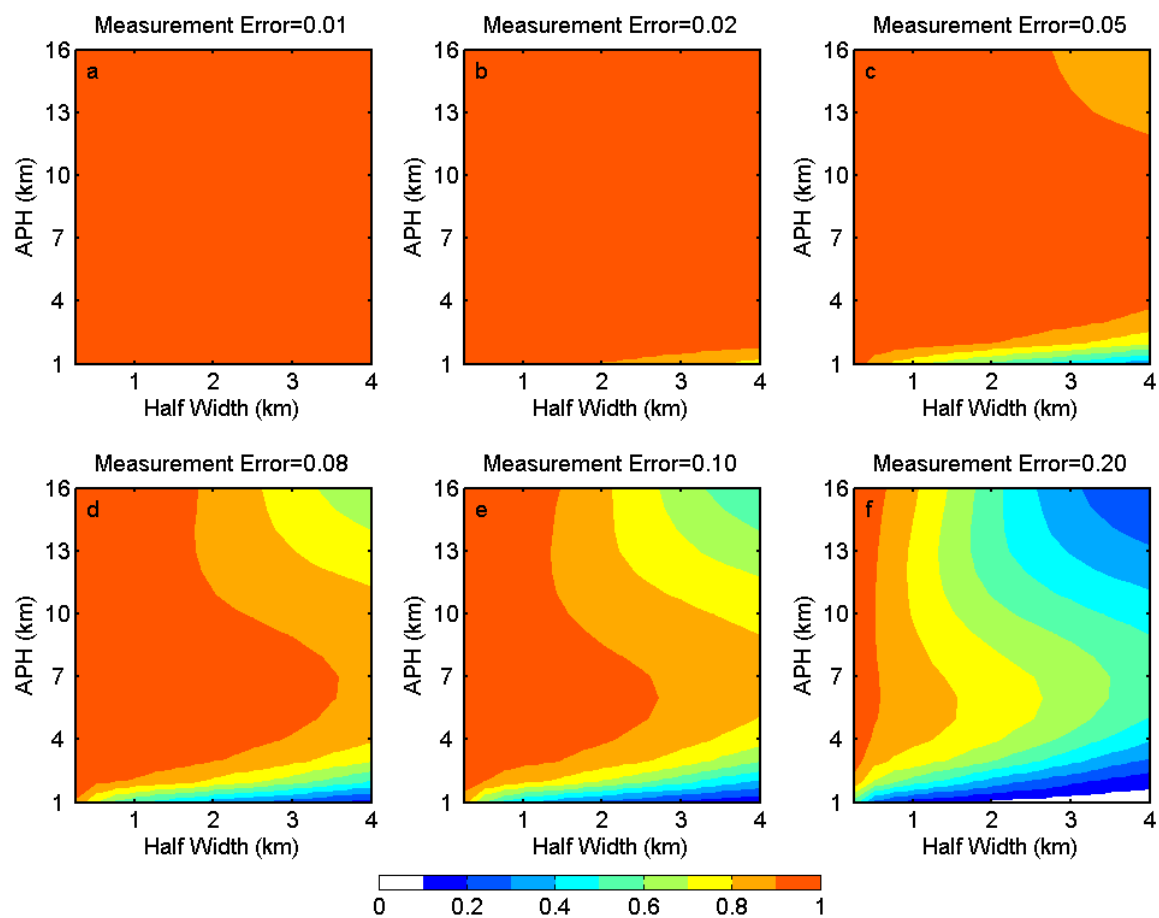
*Correspondence to:* Jun Wang ([jwangjun@gmail.com](mailto:jwangjun@gmail.com))

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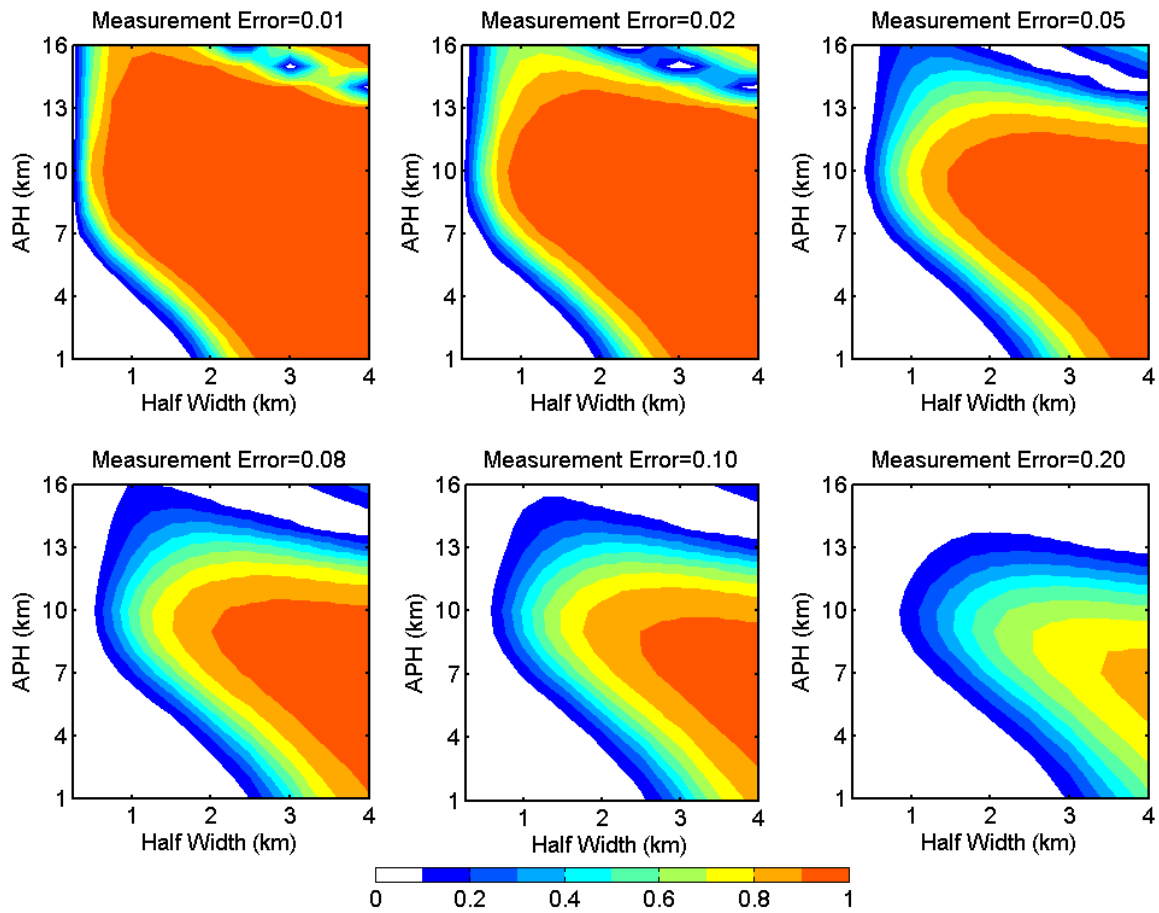


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 18 Figure S1. Contours of the DOLP at TOA as functions of aerosol peak height and half width at  
 19 two different scattering angles,  $\theta = 120^\circ$  (upper panels) and  $\theta = 150^\circ$  (lower panels), for three  
 20 different surface albedo, 0.0, 0.2 and 0.5. The wavelength is 757 nm.

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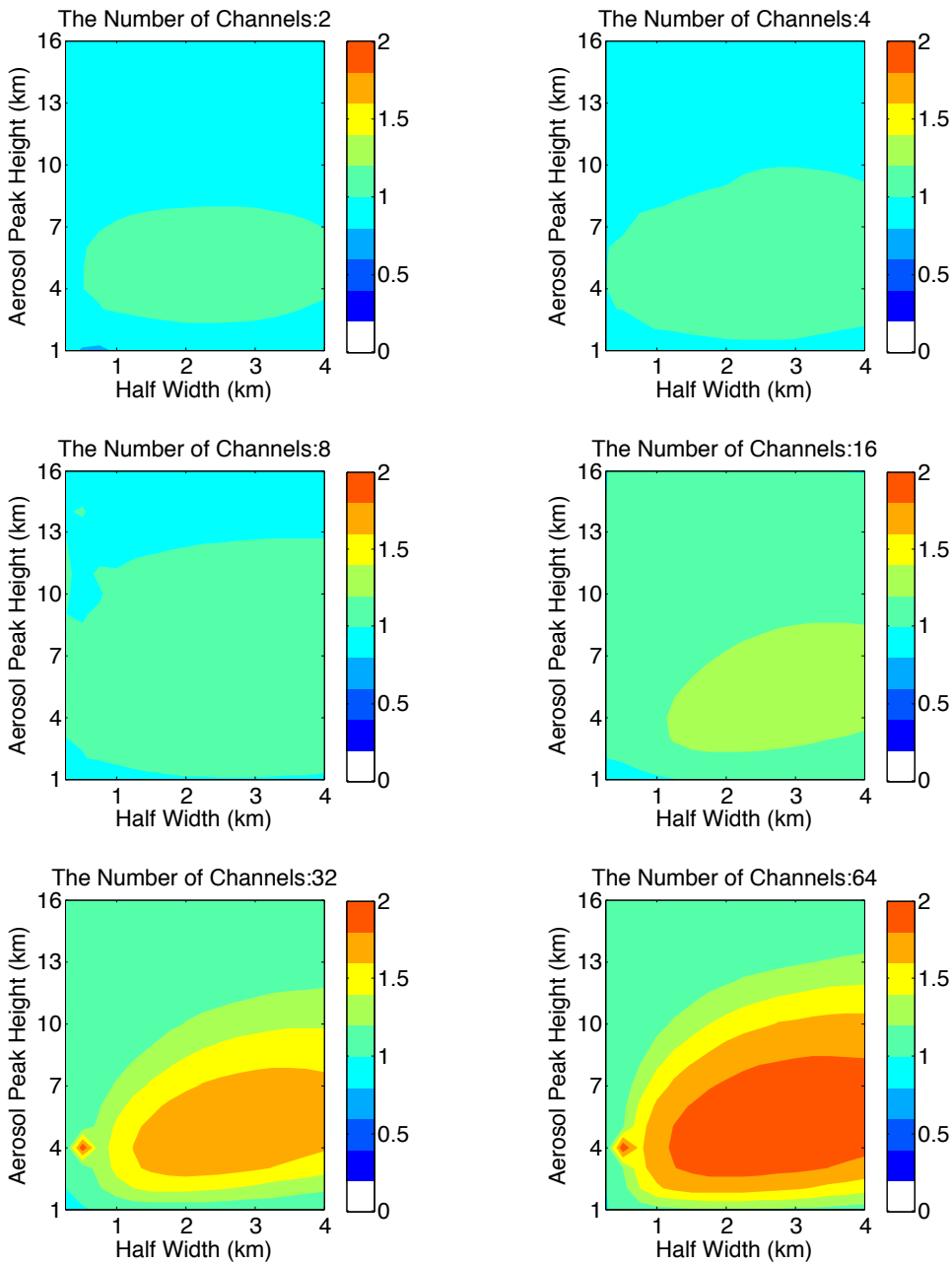
28  
 29 Figure S2. Contours of DFSs of aerosol peak height as functions of aerosol peak height and half  
 30 width calculated for different the measurement errors, 0.0. 0.01, 0.02, 0.05 0.08, 0.1 and 0.2. The  
 31 *a priori* error is assumed to be 100% aerosol peak height. The aerosol optical depth is assumed to  
 32 be 0.2. The scattering angle is  $120^\circ$ . The wavelength is 759.98 nm.  
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35 Figure S3. Contours of DFSs of aerosol half width as functions of aerosol peak height and half  
 36 width calculated for different the measurement errors, 0.0, 0.01, 0.02, 0.05 0.08, 0.1 and 0.2. The  
 37 *a priori* error is assumed to be 100% aerosol half width. The aerosol optical depth is assumed to  
 38 be 0.2. The scattering angle is  $120^\circ$ . The wavelength is 762.68 nm.

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41 Figure S4. Same as Figure 9 except that the pre-selected channels are a result of optimization for

42  $H$  of 1 km and  $\gamma$  of 1 km.

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44 Table S1. The first ten wavelengths selected for maximum contribution to the total information  
 45 content from O<sub>2</sub> A and B bands for the case with  $H$  of 5 km and  $\gamma$  of 1 km.

No.	Wavelength (nm)	DFS*	
		$H$	$\gamma$
1	690.28	0.9484	0.0473
2	764.76	0.9646	0.5494
3	763.82	0.9647	0.5569
4	687.86	0.9668	0.5693
5	766.80	0.9702	0.6383
6	687.42	0.9810	0.7439
7	762.68	0.9830	0.7850
8	689.88	0.9834	0.7855
9	759.82	0.9873	0.8257
10	764.26	0.9882	0.8436

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47 \*DFS values for both peak height and half width corresponding to the channel number  $n$  are the result  
 48 of information content analysis from a combined use of the first channel to channel number  $n$ .

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