

Interactive comment on “The Small Whiskbroom Imager for atmospheric composition monitoring (SWING) and its operations from an Unmanned Aerial Vehicle (UAV) during the AROMAT campaign” by Alexis Merlaud et al.

Anonymous Referee #2

Received and published: 24 November 2017

The paper introduced a compact remote sensing instrument (SWING) dedicated to mapping trace gases from an UAV platform. SWING-UAV experiments were performed in Romania on 11 September 2014 during the AROMAT campaign. Also some simultaneous experiments using airborne imaging DOAS (AirMAP), ground-based DOAS, Lidar and balloon-borne in-situ observations were carried out to evaluate SWING's performances. The reasonable results were obtained from these experiments, i.e. NO₂ VCD distributions, H₂O volume mixing ratio etc. The SWING instrument could be used to supervise the emission sources and mapping atmospheric pollution in the future. I

C1

consider it to be suitable for publication on AMT after minor corrections as following.

1. The important issue of VCD calculations is the AMFs. During the flight, the AMFs for SWING also depend on viewing angle, geometric angle, i.e. roll and pitch etc. Are these factors considered in the calculation of AMF?
2. The saturated absorption effect of water vapor may bring errors to the spectral retrieve of water vapor. Do the authors consider about this?
3. SO₂ is also another main product of exhaust plume from power plant. Since the spectral range of 200-750nm, it would be interesting to have a try to retrieve SO₂?
4. The middle panel in Figure 6 presents the potential temperature profiles. However, the data show the temperature increases with height. Is it thermal inversion? Inversion is easy to accumulate pollutants. What's the impact on the distribution of emissions of NO₂?
5. The Mobile DOAS VCDs are significantly higher (by approximately a factor of 2) than the airborne VCDs. Why? Please give some discussions.
6. Is there any temperature control for the instrument (spectrometer)? For the ascent and descent, how about the spectral stability?
7. The spectral resolution of SWING is 1.2nm or 1.3nm? 1.2nm in table 1, but 1.3nm on Page 3, Line 22.

Interactive comment on Atmos. Meas. Tech. Discuss., doi:10.5194/amt-2017-211, 2017.

C2