SUPPLEMENT

Multiple daytime nucleation events in semi-clean savannah and industrial environments in South Africa: analysis based on observations

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This supplement contains example figures of the multiple nucleation events together with ancillary data and air mass back-trajectory figures.

Figure S1. Two consecutive nucleation and growth events (top left panel) at Marikana on 10 November 2008. The concentration of SO_2 and H_2SO_4 proxy (top right panel), values of CS and wind direction (bottom right panel), and boundary layer height (BLH) and global radiation (bottom left panel) are also presented. The first black and red lines indicate the start and end of the first nucleation event, while the second vertical black line indicates the start of the second event. During night $\partial\theta/\partial z > 0$.

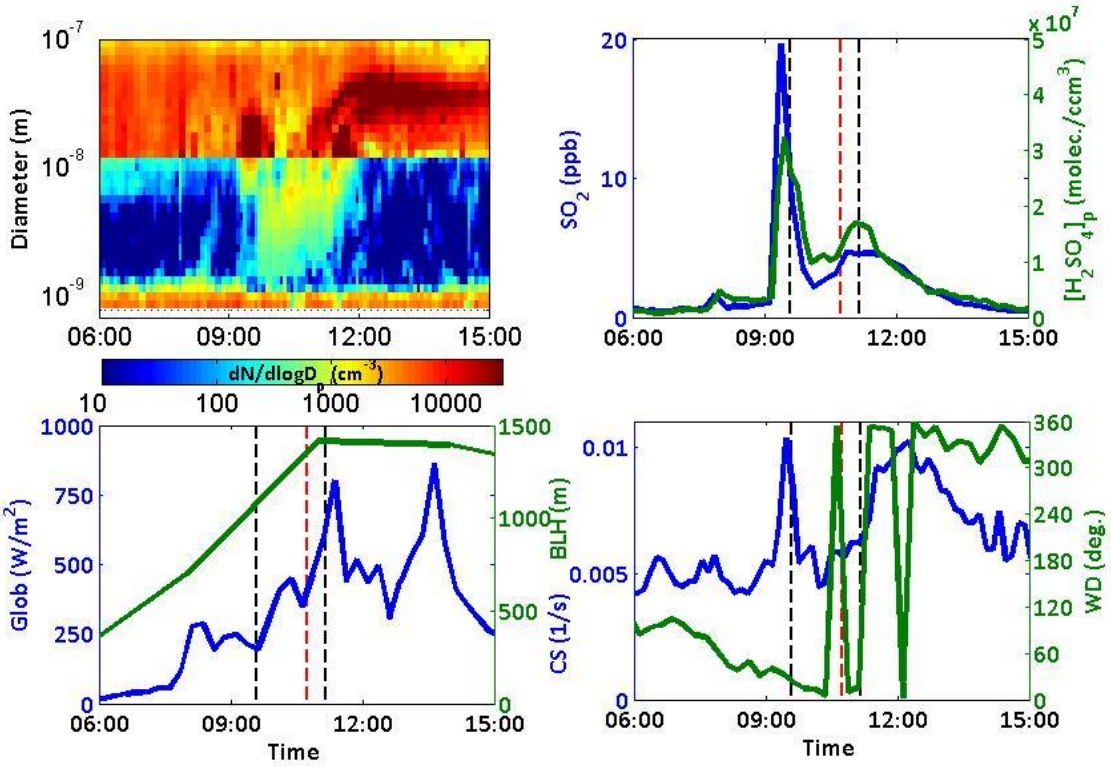

Figure S2. 96 hour air mass back-trajectories during the first (green) and second (blue) particle formation events on 10 November 2008.

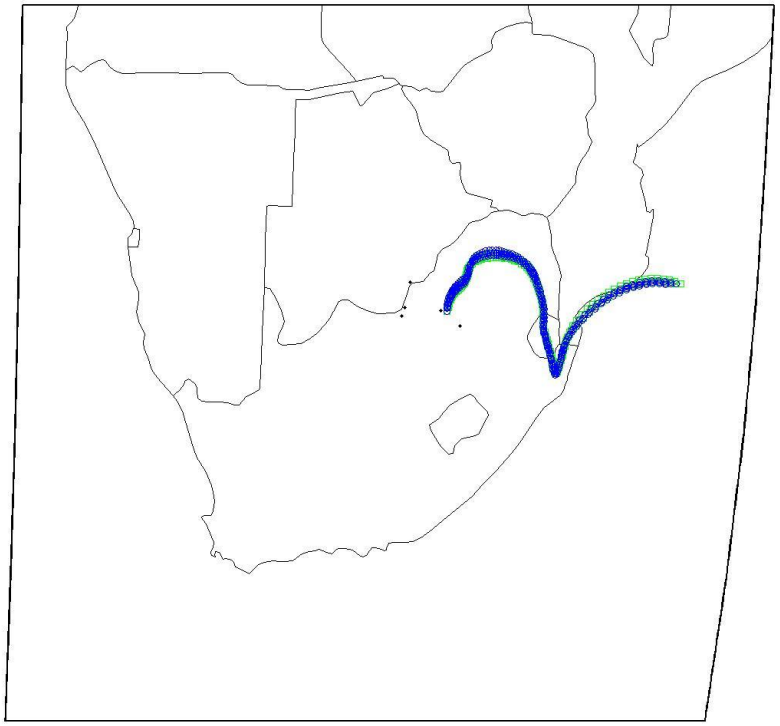

Figure S3. Two consecutive nucleation and growth events (top left panel) at Marikana on 10 December 2008. The concentration of SO_2 and H_2SO_4 proxy (top right panel), values of CS and wind direction (bottom right panel), and boundary layer height (BLH) and global radiation (bottom left panel) are also presented. The first black and red lines indicate the start and end of the first nucleation event, while the second vertical black line indicates the start of the second event. During night $\partial\theta/\partial z > 0$.

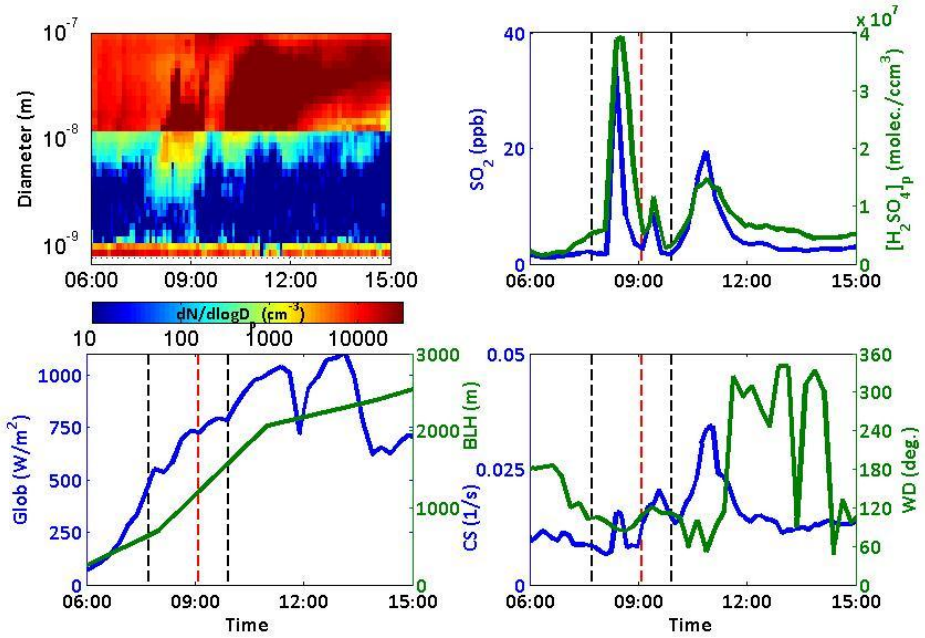

Figure S4. 96 hour air mass back-trajectories during the first (green) and second (blue) particle formation events on 10 December 2008.

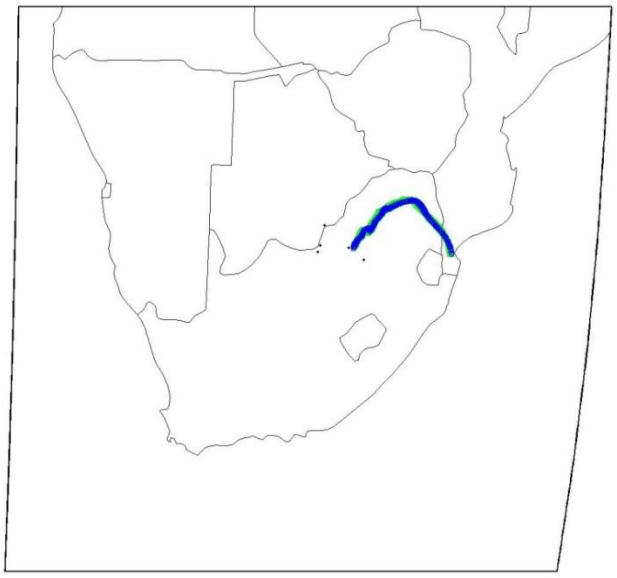

Figure S5. Two consecutive nucleation and growth events (top left panel) at Marikana on 24 September 2009. The concentration of SO_2 and H_2SO_4 proxy (top right panel), values of CS and wind direction (bottom right panel), and boundary layer height (BLH) and global radiation (bottom left panel) are also presented. The first black and red lines indicate the start and end of the first nucleation event, while the second vertical black line indicates the start of the second event. During night $\partial\theta/\partial z > 0$.

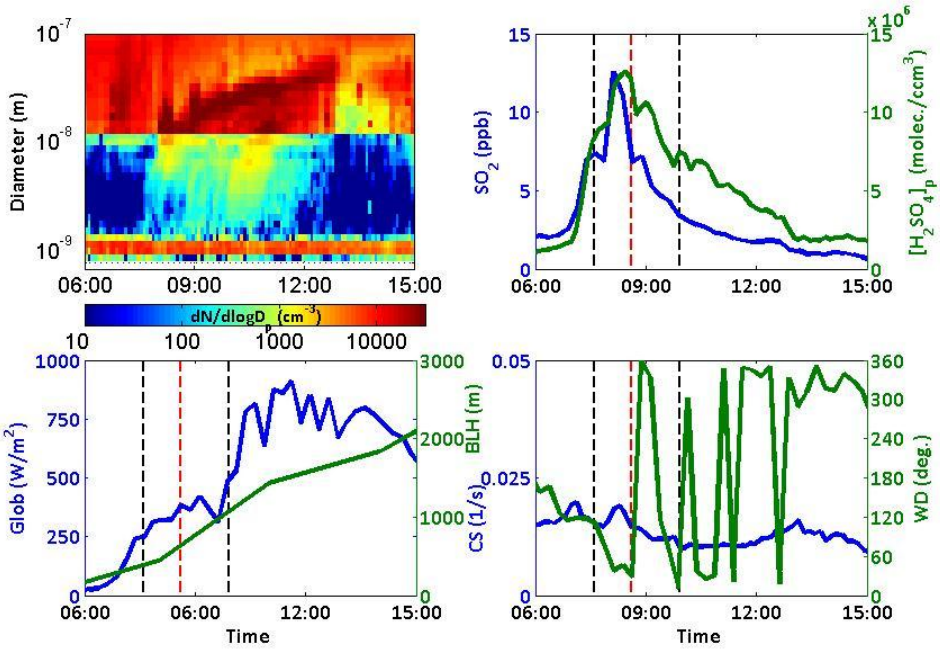

Figure S6. 96 hour air mass back-trajectories during the first (green) and second (blue) particle formation events on 24 September 2009.

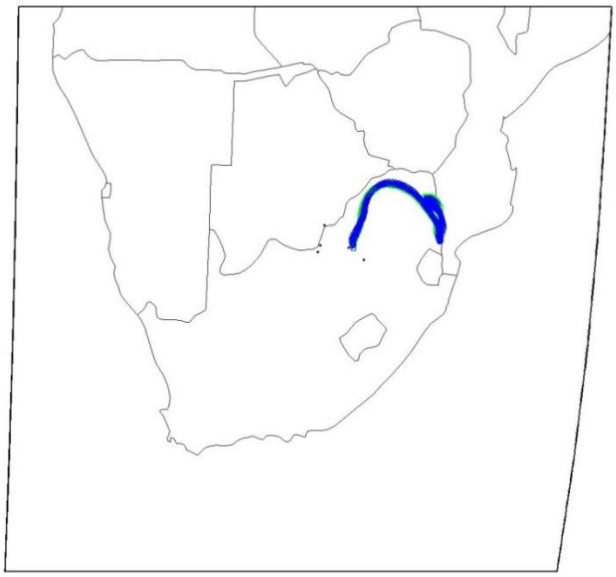

Figure S7. Two consecutive nucleation and growth events (top left panel) at Marikana on 17 November 2009. The concentration of SO_2 and H_2SO_4 proxy (top right panel), values of CS and wind direction (bottom right panel), and boundary layer height (BLH) and global radiation (bottom left panel) are also presented. The first black and red lines indicate the start and end of the first nucleation event, while the second vertical black line indicates the start of the second event. During night $\partial\theta/\partial z < 0$.

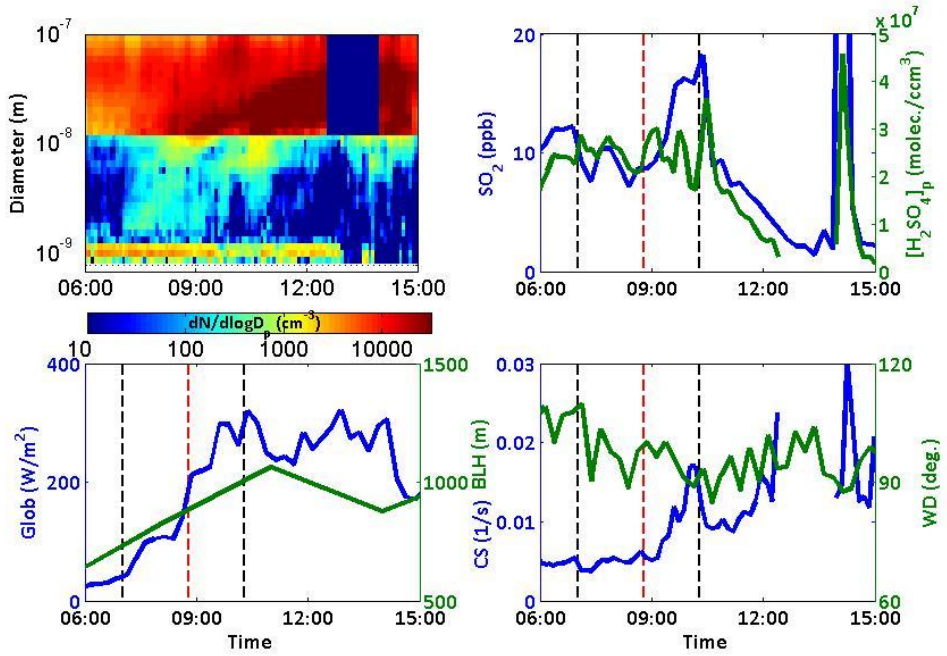

Figure S8. 96 hour air mass back-trajectories during the first (green) and second (blue) particle formation events on 17 November 2009.

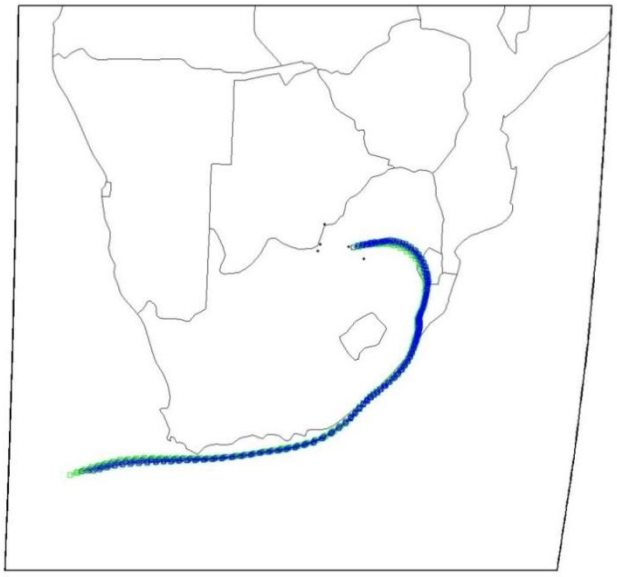

Figure S9. Two consecutive nucleation and growth events (top left panel) at Botsalano on 5 August 2006. The concentration of SO_2 and H_2SO_4 proxy (top right panel), values of CS and wind direction (bottom right panel), and boundary layer height (BLH) and global radiation (bottom left panel) are also presented. The first black and red lines indicate the start and end of the first nucleation event, while the second vertical black line indicates the start of the second event. Value for $\partial\theta/\partial z$ was not available.

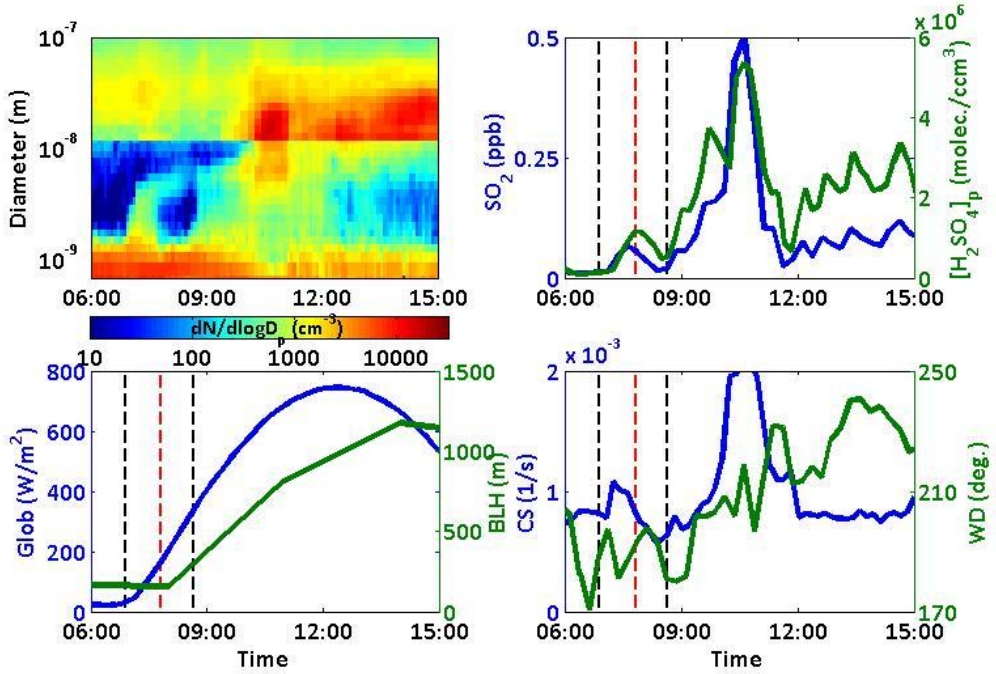

Figure S10. 96 hour air mass back-trajectories during the first (green) and second (blue) particle formation events on 5 August 2006.

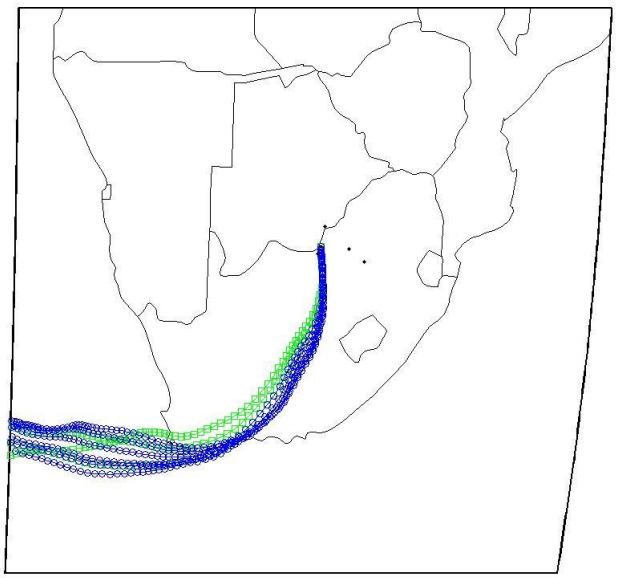

Figure S11. Two consecutive nucleation and growth events (top left panel) at Botsalano on 18 August 2006. The concentration of SO_2 and H_2SO_4 proxy (top right panel), values of CS and wind direction (bottom right panel), and boundary layer height (BLH) and global radiation (bottom left panel) are also presented. The first black and red lines indicate the start and end of the first nucleation event, while the second vertical black line indicates the start of the second event. Value for $\partial\theta/\partial z$ was not available.

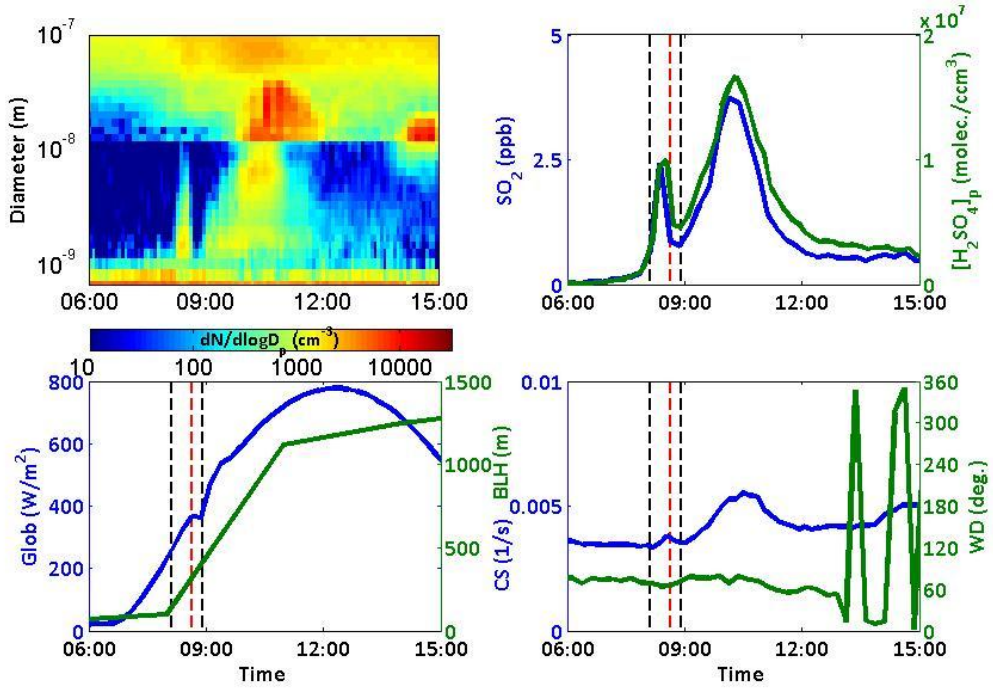

Figure S12. 96 hour air mass back-trajectories during the first (green) and second (blue) particle formation events on 18 August 2006.

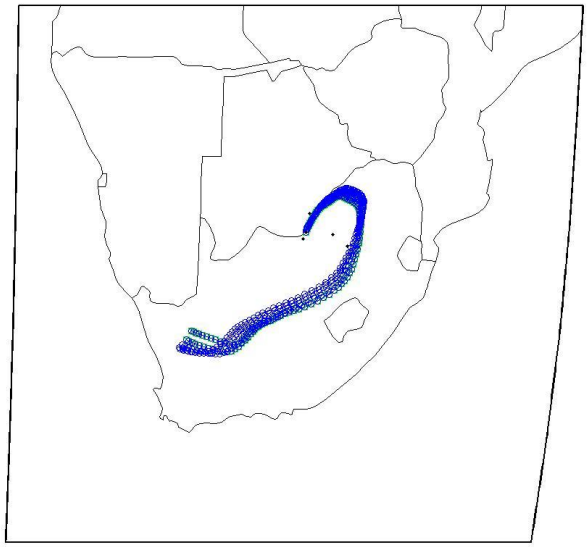

Figure S13. Two consecutive nucleation and growth events (top left panel) at Botsalano on 23 May 2007. The concentration of SO_2 and H_2SO_4 proxy (top right panel), values of CS and wind direction (bottom right panel), and boundary layer height (BLH) and global radiation (bottom left panel) are also presented. The first black and red lines indicate the start and end of the first nucleation event, while the second vertical black line indicates the start of the second event. Value for $\partial\theta/\partial z$ was not available.

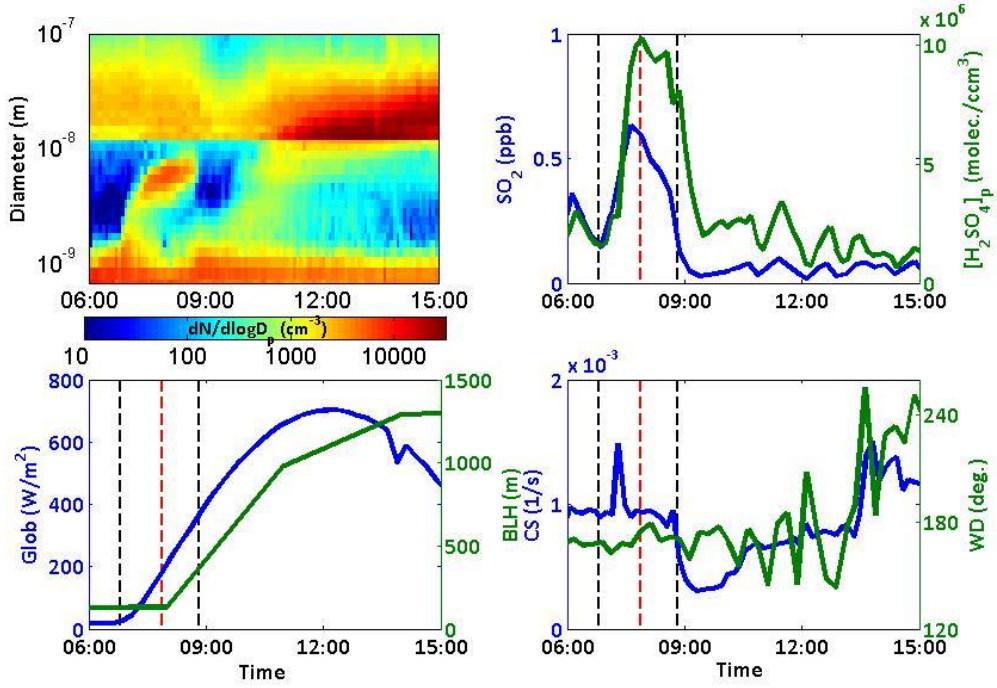

Figure S14. 96 hour air mass back-trajectories during the first (green) and second (blue) particle formation events on 23 May 2007.

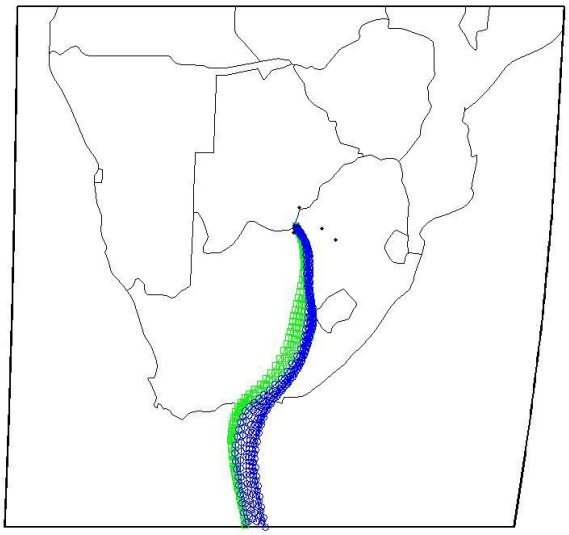

Figure S15. Two consecutive nucleation and growth events (top left panel) at Botsalano on 28 July 2007. The concentration of SO_2 and H_2SO_4 proxy (top right panel), values of CS and wind direction (bottom right panel), and boundary layer height (BLH) and global radiation (bottom left panel) are also presented. The first black and red lines indicate the start and end of the first nucleation event, while the second vertical black line indicates the start of the second event. During night $\partial\theta/\partial z > 0$.

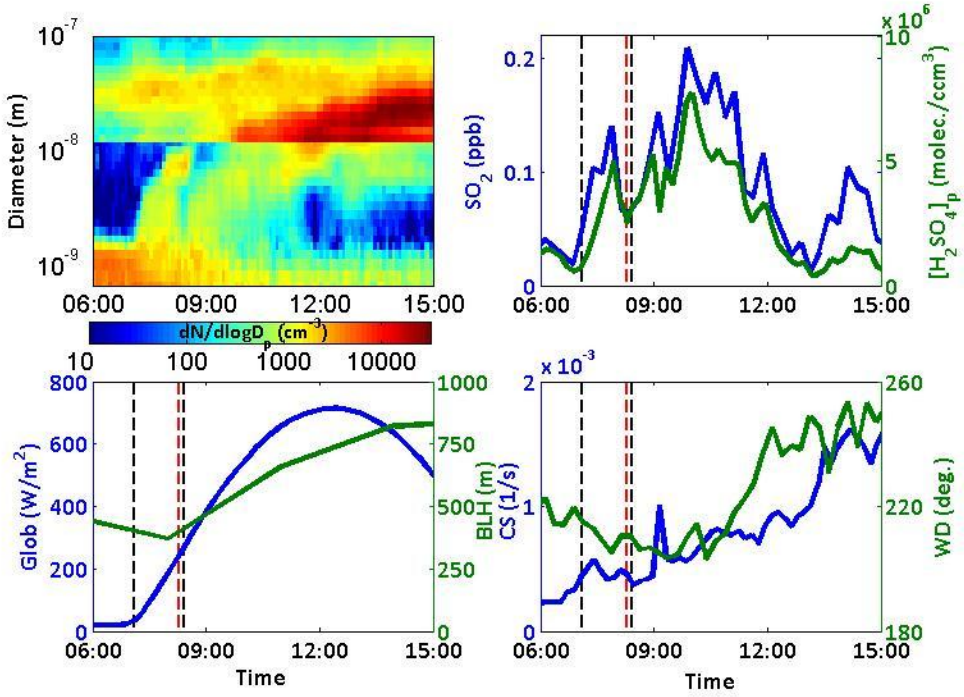

Figure S16. 96 hour air mass back-trajectories during the first (green) and second (blue) particle formation events on 28 July 2007.