



Particle Growth During Long-Range Transport of Forest-Fire Smoke in the Free Troposphere Observed with Multiwavelength Raman Lidar

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We present particle effective radii and Angström exponents of aged free-tropospheric forest-fire smoke. The particle plumes were observed with different multiwavelength Raman lidars downwind of the fires that burned in boreal areas of the northern hemisphere. We find an increase of particle size, respectively decrease of the Angström exponent with transport time which was more than two weeks in some of the investigated cases. Mean effective radii were as large as $0.4 \mu\text{m}$. Mean Angström exponents were as low as 0.04 for the wavelength pair at 355/532 nm. A fit curve that describes particle growth with time is derived. Particle growth levels off after approximately ten days of transport time.