



AMALi – the Airborne Mobile Aerosol Lidar for Arctic research

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The Airborne Mobile Aerosol Lidar (AMALi) is an instrument developed at the Alfred Wegener Institute for Polar and Marine Research for reliable operation under the challenging weather conditions at the Earth's polar regions. Since 2003 the AMALi has been successfully deployed for measurements in ground-based installation and zenith- or nadir-pointing airborne configurations during several scientific campaigns in the Arctic. The lidar provides backscatter profiles at two wavelengths (355/532 nm or 1064/532 nm) together with the linear depolarization at 532 nm, from which aerosol and cloud properties can be derived. This paper presents the characteristics and capabilities of the AMALi system and gives examples of its usage for airborne and ground-based operations in the Arctic. As this backscatter lidar normally does not operate in aerosol-free layers special evaluation schemes are discussed, the nadir-pointing iterative inversion for the case of an unknown boundary condition and the two-stream approach for the extinction profile calculation if a second lidar system probes the same air mass. Also an intercomparison of the AMALi system with an established ground-based Koldewey Aerosol Raman Lidar (KARL) is given.

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