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Cloudy bands and their microstructure in the EPICA-DML ice core

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Cloudy bands probably caused by the high dust concentrations of winter snow deposited during glacial periods are characteristic stratigraphic features of Greenland ice cores. While sofar no (Vostok and Dome C) or only few (Dome Fuji) cloudy bands were reported from Antarctic ice cores the EDML ice core drilled in Dronning Maudland contains abundant cloudy bands like the GRIP, GISP2 or NGRIP ice cores. Number and intensity of cloudy bands vary with climate, the colder the more and the more intense cloudy bands are observed. Cloudy bands indicate the layering in an ice sheet and can be used to detect flow induced disturbances in an ice core. We find increased wavyness of cloudy bands below about 2050 m depth. Clear ice contains about 1-100 optically visible particles but cloudy band ice on the order of $>$10 000, intense cloudy bands typically 105 to 106 per cm3 and more. Microscopic observations show that grain size is much smaller in cloudy bands than in the clear ice between the cloudy bands but the distribution of micro-particles is not related to grain boundaries or triple junctions.