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Climate related variations in Pb and Ba concentrations and Pb isotopes over seven glacial cycles in the EPICA Dome C ice core

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The long-term climate effects of atmospheric dust levels are poorly known due to the various positive and negative radiative forcing feedbacks associated with the hydrological cycle, so it is of value to have accurate evaluations of past atmospheric dust concentrations and provenance. Lead isotopic compositions and Pb and Ba concen-

trations are reported in the EPICA Dome C ice core for the period 7 ky BP to 671 ky BP. Lead and Ba concentrations vary with glacial/interglacial climate cycles, while Pb isotopes can provide information on climate-related variations in dust provenance. It was found that Pb isotopic compositions were less radiogenic and less variable in samples dated prior to 220 ky BP, compared to more recent samples. We confirm a dominant southern South American source for dust in central East Antarctica and suggest that this source was more dominant in earlier glacial-interglacial cycles. The data indicate at least one other major dust source consistent with local Antarctic volcanism or a radiogenic dust source.