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Preliminary study on continuous Black Carbon measurements at Monte Cimone high mountain Station (Italy)

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Through so-called “direct-effect”, aerosols scatter and/or absorb the solar radiation, thus cooling the Earth’s surface and changing the radiative balance in the atmosphere. Most aerosol particles, such as sulphate and sea-salt particles, mainly scatter solar radiation, whilst soot in the form of elemental carbon or "black" carbon (BC) in addition leads to considerable absorption. In this study we present first BC measurements carried out at Monte Cimone Station (2165 m a.s.l., Italy). The Particle Absorption Photometer (PSAP) was used to measure in near real time the optical extinction coefficient for absorption which can be used to estimate the corresponding concentration of fine particle soot. The method is based on integrating plate technique in which the change in optical transmission of a filter caused by particle deposition is related to the optical absorption coefficient. An intercomparison with Multi Angle Absorption Photometer, that takes into account the multiple scattering interferences, was carried out along a week during fall 2005. The measurements started in the early summer 2005, and are ranging from values below detection limit until 2 μg m^{-3}. The typical diurnal variation show a maximum in the middle afternoon and nigh time low levels.

Correlations with aerosol physical properties, ozone concentration, meteorological parameters will be also presented.