Abstract

LPME (Long Path Multiwave Extinction analyzer) is an optical method that is used for the determination of aerosol characteristics, especially soot. In particular the mean diameter of the particles that consist the aerosol and the volume fraction. This method is based on the measurement of the extinction that undergoes a multiwavelenght laser beam as it travels through an aerosol. The extinction is described by the Beer-Lambert law.

The present work is developed around four main tasks that were set and accomplished. The first was the development of a new DAQ system to support the LPME. The second was the development of the data treatment and analysis software. The third was the examination of some theoretical aspects concerning LPME. The last was the usage of the LPME, along with the newly developed software, for the determination of the characteristics of soot generated by CASt2 and the comparison with SMPS data.

The results showed that the LPME is a reliable tool for the determination of soot volume fraction. In support of that comes also the relatively good correlation with SMPS data. As for the diameter determined by LPME, it seems that it is identified with the diameter of the primary particle of the soot aggregate than that of the aggregate itself.