



Turbulent Fluxes over Aegean Sea during the Aegean-Game airborne campaign

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We investigate the boundary layer structure over the Aegean Sea during the Etesian winds, based upon airborne measurements (Aircraft_BAe146-FAAM). Measurements include 4 flights in the period from 29 August to 8 September 2011. The flights (4-5h each) were of similar route covering the eastern and western parts of the Aegean Sea, from Crete (south) to Limnos (north) islands. Two of the flights were performed on the same day to study the impact of the diurnal cycle. The sorties involved horizontal tracks mainly at 150m and above the mixing layer depth. Atmospheric turbulence measurements (32Hz) were obtained with a radome probe, located at the nose of the aircraft, combined with fast GPS/INS attitude angle measurements for the estimation of wind components and with high-frequency temperature and humidity measurements. The turbulent quantities at 150m a.s.l. were calculated using the eddy-correlation method with the horizontal averaging length set to 5km. Mean statistics as well as fluxes of momentum, sensible and latent heat are investigated and reported against several factors (e.g. geographical region, time of the day, wind speed). In most cases the wind speed was higher than 12ms⁻¹ and in many cases approached 20ms⁻¹. The values of the stability parameter z/L (at 150m a.s.l.) ranged from -5 to 5 . Preliminary results show that the wind stress has a strong variation through the Aegean Sea. The higher values of wind stresses were calculated over the central Aegean, while significantly lower values are estimated over the northern part of the region. The higher values of sensible heat flux are measured over the central Aegean Sea. Most of the area is characterized by negative heat flux (up to -40 Wm⁻²). Profiles of mean meteorological variables together with concentration profiles of O₃ and CO are also presented, giving information about the mixing layer depth.