

During the SMARTEx (Small Marine Target Experiment) –trial at Dauphin Island (Alabama/US) in June 2012 the output of the COSMO model of the German weather service (DWD) for Dauphin Island was used to estimate the turbulent modular transfer function (MTF) of wave propagation in the near infrared.

The turbulent modular transfer function characterizes the resolution limit on sensor performance due to atmospheric turbulence. It was analyzed for sensors relying on wave propagation in the near infrared.

Weather forecast model output data of temperature, humidity, pressure and wind velocity as well as the sea surface temperature were used as input for the LWKD-model (DRDC, Valcartier, Canada) to calculate the height dependent structure function parameter of the refractive index C_n^2 , the characteristic parameter of optical turbulence. Together with the crosswind speed they are the main contributing parameters to the turbulent MTF. These predicted data were compared to the experimental determination of the modulation transfer function relying on in situ measured meteorological parameters and the integrated optical turbulence between Dauphin Island and the Fort Morgan Peninsula. The measurements of turbulence were performed using a Boundary Layer Scintillometer (BLS2000, Scintec Co., Germany) at a height of 5 m above the ocean. The horizontal distance above the sea was about 5.8 km. In June the area is characterized by a warm ocean (Gulf of Mexico) and a hot and humid climate. The results of this comparison will be presented and discussed with a focus on the time period between the 13th and 15th June 2012.