The presentation describes investigations of neutral atmosphere zenith delay based on analysis and forecast fields from mesoscale weather model. The Coupled Ocean/Atmosphere Mezoscale Prediction System, Naval Research Laboratory, Monterey Marine Meteorology Division (COAMPS-NRL) was used. Model runs in operational mode in the Centre of Applied Geomatics (Faculty of Civil Engineering and Geodesy, Military University of Technology, Warsaw). Tests were performed using data from ASG-EUPOS (Active Geodetic Network European Position Determination System) network. ASG-EUPOS is the Polish multifunctional augmenting system of for precise positioning consisting of more than 120 permanent GNSS reference stations. In the first step, ZTD time series taken from network (Bernese 5.0) and Precise Point Positioning (GPSTools 0.64) solutions for selected periods were analyzed. Afterwards, the comparison of solutions obtained by two methods was made. The first method is based on standard troposphere parameters used by Bernese 5.0 software, the second takes into consideration the ones calculated on the basis of mesoscale meteorological fields. Refraction and ZTD (Zenith Total Delay values) fields required for calculation were interpolated from the model grid with the spatial resolutions of 13, 4.3 and 1.44 km for every hour in the 24-hour range. The ray tracing method was employed for zenith and slant delay determination.