Coseismic ionospheric disturbances (CIDs) are the response of the ionosphere to large earthquakes. CIDs have been mostly observed by HF-Doppler sounders and by ground-based GPS receivers. Several types of CIDs have been observed so far. First type is ionospheric response to acoustic waves generated by a quake. These waves have been commonly described as N-type waves with magnitude ~0.1 TECU ($1 \times 10^{15}$ e$^{-}$/m$^{3}$) and propagating with the velocity ~1 km/s. The other main type of CIDs is the “ionospheric image” of propagating seismic surface Rayleigh waves. Such perturbations are known to be as fast as 2.7-3 km/s in the ionosphere. However, despite numerous CIDs’ observations, further investigations of CIDs are necessary for better understanding of the processes of transformation of neutral waves into ionospheric perturbations. Besides, it should be noted that all known studies on dynamic characteristics of the CIDs have been performed in the northern hemisphere of the Earth. Therefore, it is of great interest to investigate ionosphere response to earthquakes occurred in the southern hemisphere that would give us the lacking information on the CIDs’ propagation with regard to the geomagnetic field.

By use of ground-based GPS measurements, we analyse main features of CIDs generated by a series of large earthquakes in South America and New Zealand in 2004 - 2011. We also compare the experimental data with perturbations, calculated by the summation of normal modes and the consequent modelling of atmosphere/ionosphere coupling.