

# Effects of the December 14, 2020 total solar eclipse on two ionospheric stations in Chile and Argentina

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## Abstract:

On December 14, 2020 we had the possibility of observing a wonderful phenomenon of nature: an eclipse of the Sun. To study ionospheric parameters variation during this event, we carried out a collaboration campaign between researchers from Chile and Argentina, given that the eclipse totality passed through our region. This work analyzes the variations in the critical frequencies of the E, F1, and F2 layers during the eclipse obscuration for two ionosonde stations: Chillán (36.6°S, 72.0°W), in Chile, and Bahía Blanca (38.9°S, 62.2°W), in Argentina. Both stations reach a similar maximum obscuration (95%), however differences in the ionospheric response are obtained at these locations. Measured data are compared with IRI-2016 simulated data. During the eclipse, variations of the order of 31% for foE and of the order of 36% for foF1 are observed as maximum reductions at the maximum solar radiance reduction time, while no significant variations are observed in the case of the F2-layer critical frequency. This international campaign has demonstrated a successful joint effort to study this phenomenon and also fosters the generation of a future ionospheric measurement collaboration network in the Latin American region.

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