## A procedure for the automatic scaling of oblique ionograms

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In this work we present a method for the identification of trace characteristics of oblique ionograms allowing determination of the Maximum Usable Frequency (MUF) for communication between the transmitter and receiver. The algorithm automatically detects and rejects poor quality ionograms. An exploratory test of the algorithm has been performed using data from a campaign of oblique soundings between the ionosondes of Rome, Italy (41.90 N, 12.48 E) and Chania, Greece (35.51 N, 24.01 E) and also between the ones of Kalkarindji, Australia (17.43 S, 130.81 E) and Culgoora, Australia (30.30 S, 149.55 E). The success of these tests demonstrates the applicability of the method to ionograms recorded by different ionosondes in various helio-geophysical conditions.

We also converted the 384 oblique ionograms related to the Kalkarindji- Culgoora radio link, into vertical ionograms. Autoscala program has been then applied to these ionograms to obtaining a series of autoscaled values. The MUF values obtained by the autoscaling of the original oblique ionograms have been compared with the ones obtained by Autoscala using the converted vertical ones. Indeed, a great percentage of MUF values calculated by Autoscala program lie within 0.5 MHz from the ones provided by our oblique ionogram automatic scaling software. The procedure we propose, made by the combined use of the oblique ionograms autoscaling algorithm and Autoscala program, shows a good behavior even in terms of computing time, as it takes less than 3 min to provide a MUF value for each ionogram. This suggests it could be a useful package for the automatic scaling of the oblique ionograms from different ionosondes.