



## **Correlation analysis of whistler rates and lightning discharges**

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The results of comparison of whistler rates recorded in Kamchatka, at IKIR FEB RAS stations, and lightning discharge rates recorded in Kamchatka and in magnetically conjugate point in Australia according to the data of World Wide Lightning Location Network (WWLLN) and Automatic Whistler Detector and Analyzer system network (AWDANet) are presented. Visual analysis has shown that according the theory of whistler formation, most of them may be associated with lightning sources in Kamchatka (LAT 43N-63N LON 150E-170E) and in Australia (LAT 25S-45S LON 140E-160E).

To verify the statistical significance of visually observed relation, correlation of time series of the two rates were analyzed. The rate was characterized by a number of events in a 15 minute interval. Normalized cross-correlation function was calculated in a 1 day running time window. The statistical significance of correlation was determined at 0.05 level. Time interval under the consideration was March 1-11, 2013.

The calculations has shown that there is a considerable correlation of whistler rates in Kamchatka with the lightning source in Australia when sharp changes in one of the rates appear within a time window. This may be explained by high sensitivity of correlation characteristics to data bursts. We may conclude that it is necessary to apply statistical characteristics which are stable to bursts and based on fractiles.