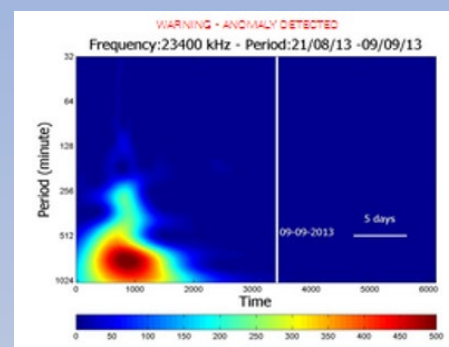
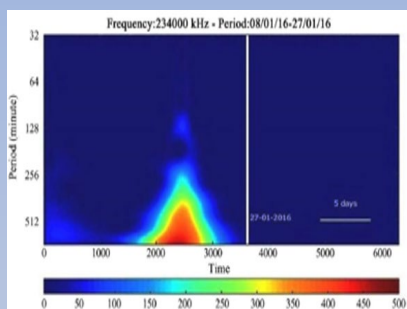
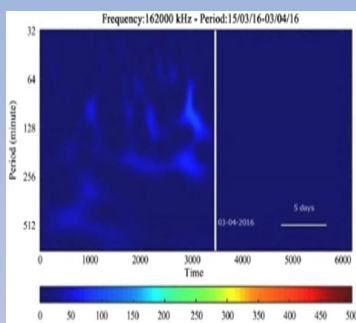


WAVELET ANALYSIS



THE WAVELET SPECTRUM IS THE TOOL USED TO DETECT ANOMALIES IN THE PROPOGRATION OF VLF AND LF RADIO SIGNALS, POSSIBLY RELATED TO PRESEISMIC PHENOMENA. A POWER SPECTRUM IS A 2D PLOT THAT GIVES INFORMATION ON THE ENERGY OF FREQUENCY COMPONENTS IN THE RADIO SIGNALS WITH GOOD TIME AND FREQUENCY RESOLUTION. ANOMALIES CORRESPOND TO LOCAL (IN TIME AND FREQUENCY) HIGH ENERGY SPOTS (COLORBAR AT THE BOTTOM OF FIGURES ABOVE, REPRESENTS THE NORMALIZED POWER SPECTRUM).

THE WAVELET ANALYSIS IS PERFORMED ON A DAILY BASIS USING THE SIGNAL COLLECTED IN THE PREVIOUS TWENTY DAYS. FIGURES ABOVE SHOW THE CASES OF A NORMAL CONDITION (LEFT), THE OCCURRENCE OF AN ANOMALY (CENTRE) AND THE ONLINE WEB SERVICE SET UP TO SEND AN ALARM WHEN AN ANOMALY LARGER THAN A THRESHOLD IS DETECTED (LEFT). THE DAY TO WHICH THE WAVELET ANALYSIS CORRESPONDS TO IS DENOTED BY A WHITE VERTICAL LINE. THE PART OF THE SPECTRUM AFTER THE DAY IS RELATED TO 15 DAYS DATA WITHOUT ANY FREQUENCY ADDED TO AVOID BORDER EFFECTS. CURRENTLY, THE WEB SERVICE IS NOT AVAILABLE DUE TO A HACKER ATTACK.