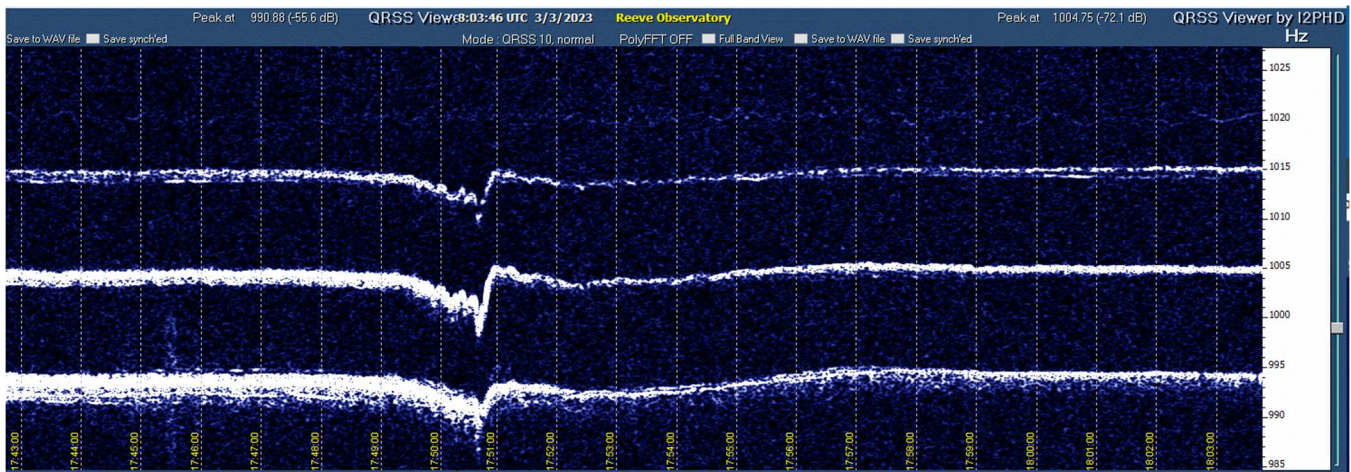


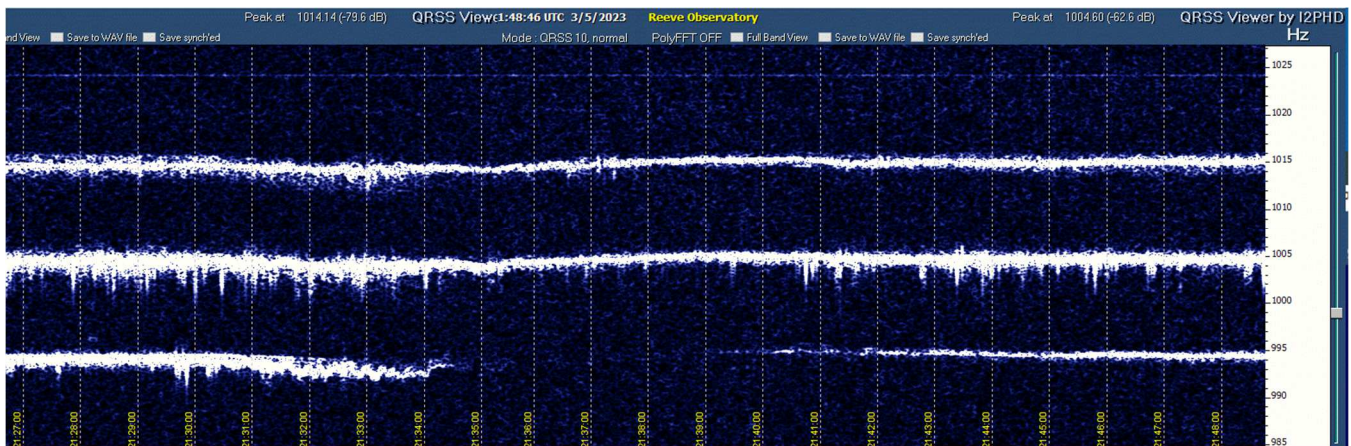
Solar Radio Observations at Anchorage, Alaska in March 2023

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Sudden Frequency Deviations at 15, 20 and 25 MHz on 3 March 2023: The sudden frequency deviations (SFD) were observed to start at 1749 with peak effects at 1750:40 and recovery about 10 minutes later; see Argo plot below. The bottom trace at 995 Hz represents the 15 MHz carrier, the middle trace at 1005 Hz represents the 20 MHz carrier and the upper trace at 1015 Hz represents the 25 MHz carrier. All carriers are from the WWV or WWVH time-frequency stations. The SFDs were caused by the radiation from an X2.1 x-ray flare at solar active region 3234. The flare radiation began at 1742, peaked at 1752 and ended at 1759. The Sun position from Anchorage at 1751 was 115° true azimuth and 5.6° elevation; sunrise had been about 1 h before.



Radio Blackout at 15 MHz on 5 March 2023: Solar active region 3243 produced an M5.0 x-ray flare starting at 2129, peaking at 2136 and ending at 2141. The radiation from the flare enhanced the ionosphere's D-region electron density, thereby increasing the absorption at 15 MHz and producing a radio blackout. Referring to the Argo plot below, the radio blackout at 15 MHz, represented by the 995 Hz trace, was observed to start at Anchorage at 2134 with partial recovery about 10 minutes later. The carrier frequencies at 20 and 25 MHz (middle and upper traces at 1005 and 1015 Hz, respectively) also were affected but not severely enough to produce a radio blackout at those frequencies in the path to Anchorage.



The D-Region Absorption Prediction (D-RAP) plot produced by Space Weather Prediction Center for 2137 (below) shows 3 – 4 dB attenuation at 15 MHz and somewhat less at 20 and 25 MHz as seen in the histogram on the right side of the plot. These values take into account the radio wave's 2-way passage through the D-region. The Sun position from Anchorage at 2137 was 171° true azimuth and 22.6° elevation.

