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Metric radio bursts and fine structures observed on 20 January, 2005

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Abstract. A major radio event, associated with an X7.1/2B flare in AR720 and a fast CME, was observed on January 20, 2005 with the radio-spectrograph ARTEMIS-IV; it was particularly intense and with a complex radio signature with rich fine structure which was recorded in the 270–420 MHz range at high resolution (100 samples/sec). The fine structure is compared with similar results in the decimetric and microwave frequency range. It was found to match, almost, the comprehensive Ondřejov Classification in the spectral range 0.8-2 GHz.

Data Analysis & Results

In our dynamic spectra, obtained with the by the SAO receiver of the ARTEMIS-IV (Caroubalos & al. 2001; Kontogeorgos & al. 2006, 2008), the continuum background was removed by means of high-pass filtering on the dynamic spectra (differential spectra in this case). The morphological characteristics of fine structure elements embedded in the metric continuum almost, match the comprehensive Ondřejov Catalogue (Jiříčka & al. 2001) in the 0.8-2 GHz range. The high resolution (100 samples/s) SAO recordings permitted the recognition and classification of the type III(U) and III(J) subcategory of the narrowband type III bursts in the metric frequency range; similar structures have been reported in the microwaves (Fu & al. 2004).

Our observations of fine structures are, briefly, presented in the following subsections; they match, almost, similar results in the decimetric and microwave frequency range (Jiříčka & al. 2001, 2002; Fu & al. 2004; Mészárosová & al. 2005).

Broadband Pulsations, Fibers & zebra structures The pulsations last for hours and form the background of the dynamic spectra as the type IV continuum has been suppressed (cf. figure 1 (a) & (b)); they are, for most of the same period, associated with fibers. The associated zebra structures cover almost the entire pulsation-fiber period.

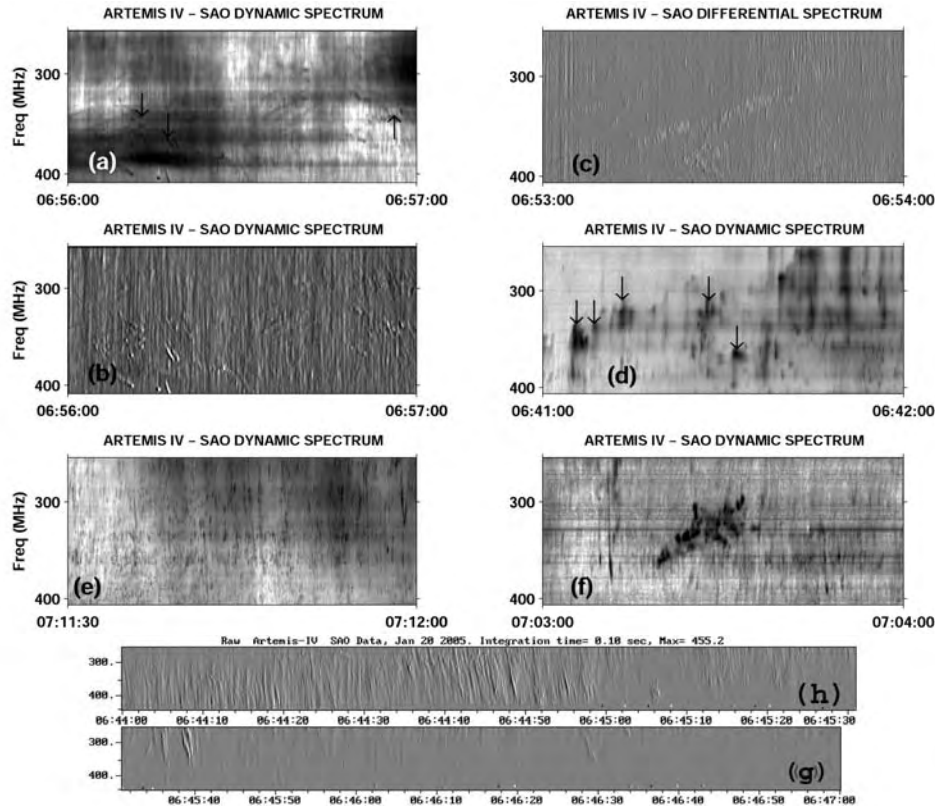


Figure 1. (a)& (b) High Resolution (0.04 sec) Dynamic & Differential Spectrum of Pulsating structures, with fibers & narrowband slow & fast structures and a Lace Burst (rightmost arrow on (a)). (c) Super Short Narrowband Type III (d) Narrowband III(J), III(U) & Spikes. (e) Dot Patches (f) Narrowband III(J)& III(U) (g)&(h) Type III(RS) & Narrowband Type III

The narrowband activity (figure 1(a)–(g)) included Spikes, Narrow Band Type III (and U) bursts as well as Dot Patches (first reported by Magdalenic & al. 2006, as Super Short Structures). In figures 1(a)&(b) a group of slowly & fast drifting narrow band structures outline a *Lace Burst* (cf. Karlický & al. 2001).

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