

The natural “W” – A model for the specific shape of double notches

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ABSTRACT: The aim of this work is to explain the astonishing shape of the double notches observed in pulse profiles of B1929+10, B0950+08 and J0437–4715. So far the feature has been interpreted in terms of a double eclipse of an extended radio emission region by a single opaque object, possibly the neutron star embedded in a plasma cloud. The doubleness of the eclipse resulted from differential, altitude-dependent effects of aberration and propagation time delays. Here we propose a qualitatively different model that possesses natural tendency to reproduce the key observed properties of the notches: their separation equal to the width of a single notch, similar depths of both notches, and their merging at higher frequencies. We present preliminary results of several detailed numerical simulations of how the notches are formed in the radio pulse profiles.