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Coronal conditions during the onset of type-II radio bursts

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We study the link between CME shock waves and radio bursts. We derive the 3D-distribution of Mach number, geometry and compression ratios of coronal shock waves using reconstruction techniques based on multi-viewpoint observations combined with the results of MHD simulations of the corona. We present here a comparison of the derivation of the time-varying shock properties with the evolution of type-II radio bursts. When available we consider observations by the Nançay radioheliograph to determine the source locations of the radio sources along the modeled shock surfaces. The results confirm that the type-II radio bursts tend to originate in regions where the shock is highly quasi-perpendicular. We focus in particular on the interpretation of drift rates and band splitting of the radio bursts. From the derived properties of the shock we then compute electron flux in different energy bands assuming shock-drift acceleration as the primary acceleration mechanism for electrons. We investigate regions where energetic electrons are efficiently produced and compare those with the sources of radio emissions. We highlight the importance and influence of the global topology of the background corona on the occurrence of a type-II radio burst.