

Low-frequency Solar Bursts and Sun-Earth Connection

NAT GOPALSWAMY, ERNESTO AGUILAR-RODRIGUEZ, MICHAEL L. KAISER, and
ROBERT J. MACDOWALL

NASA Goddard Space Flight Center, Greenbelt, MD 20771, USA

Radio observations of provide the earliest signature of shocks in the corona in the form of type II radio bursts. These bursts are known from ground based observations for more than half a century. However, all metric type II bursts do not result in shocks in the interplanetary medium. Type II radio bursts at frequencies below about 15 MHz are indicative of shocks that significantly affect the inner heliosphere because the associated coronal mass ejections are fast and wide. These radio bursts have to be observed from space because the terrestrial ionosphere is opaque to radiation at frequencies below ~ 15 MHz. We present the properties of CMEs associated with type II bursts that extend from metric to kilometric wavelengths and describe a future mission known as the Solar Imaging Radio Array (SIRA) to image these bursts for the first time. These type II bursts extending from metric to kilometric wavelengths originate from CMEs of the highest energy and represent an important aspect of Sun-Earth connection. Imaging these bursts provides a potential means of identifying those CMEs that can cause adverse conditions by accelerating charged particles and by direct impact.