

Detection of Gamma Ray Bursts and X-ray transient SGR1806-20 with VLF Radio Telescopes

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The VLF computer model proposed in this paper examines whether gamma ray bursts (GRB) or X-ray transient flux from distant supernova can be detected by amateur VLF radios. Arguments presented in this paper compare how GRBs created from supernova events might cause detectable signatures similar to magnetar or other local X-ray transient Sudden Ionospheric Disturbances (SID). High-energy GRB and short X-ray transients of supernova (SN) origin affect the upper ionosphere through Compton free electron interaction and not through magnetic field reconnection as local solar plasma might affect the earth's magnetosphere. Gamma ray and X-ray ionization of the upper F2 layer, or thermosphere, should be a measure of ionizing radiation as small as 10^{-6} ergs, yet may not be detectable with amateur VLF radios. High-energy solar plasma interactions causing ionization have larger energy regimes, which impact the lower ionosphere layers. Local atmospheric events such as lightning, and sprites also confound detection of SN GRB. Only events of very long duration, such as the nighttime ionosphere disturbance from SRG1900+14, or a recent 'super flare' from SGR1806-20 located toward the center of our galaxy 45,000 light years away from earth, and GRB030329 <http://www.konkoly.hu/cgi-bin/IBVS?5415> have been detected at Very Low Frequencies (Peterson and Price et. al, 2003, Price et. al, 2004).