Nobeyama/HXT Observations of Impulsive Flares

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We present results of an analysis for 25 solar impulsive flares, which are systematically selected from the flares observed simultaneously with the Nobeyama Radioheliograph and the *Yohkoh* satellite. The results are summarized as follows; (1) for half of the analyzed 25 events two, at least, flaring loops are involved, (2) typical sizes of the two loops are different from each other (one is typically $\leq 20''$ and the other $30''$–$80''$), and (3) in hard X-rays, the smaller one of the two loops is preferentially bright. These results are consistent with those given in a previous paper (Nishio et al. 1997), where they used a subset of analyzed 25 events. The results strongly suggest that the interaction of the two loops plays a dominant role in releasing magnetic energy and producing energetic electrons.

¿From the detailed analysis of two out of the 25 events, we find a triple source structure, a closely located double source corresponding to footpoints of the short loop and a remote source located at a footpoint of the long loop, is relating with a single events. From the results that the peak of the first spike of the close double sources proceeds to that of the remote source, and the remote source becomes prominent at later phase of the event, the particle acceleration site seems to be located near the small loop. On the other hand, the close double and the remote sources do not necessarily show same HXR flux spectra; the spectrum of remote source is header than that of the close double sources at the intensity maximum of the remote source. Time of flight along the long loop is quite short comparing with the observed delay between the HXR close double and remote sources, ≈ 2 s, for the electrons with the energy of order of few 10 keV. Thus, to the events analyzed a simple loop-loop interaction mechanism, in which the small and large loops connect to each other and the electrons accelerated near the reconnection region directly precipitate to the footpoints, cannot be applied. Another mechanisms, such as the trapping and diffusion of high energy electrons in the longer loop, will be taken in account. Further analysis and theoretical interpretation relating with the flare source evolution is required.