X-ray and radio observations of a global coronal shock wave
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We report observations of a bright, propagating disturbance in the solar corona observed in full-disc soft X-ray images of the Sun from the Yohkoh Soft X-ray Telescope (SXT). The disturbance was associated with a flare which began at about 09:04 UT on 1997 November 03. The GOES 9 X-ray flux data and the SXT images allow us to directly image the source locations of the type II radio burst. The properties of this burst are closely related to the shock wave and may be the coronal counterpart of a Moreton wave, analogous to EIT waves.

\textbf{Abstract}

\begin{itemize}
  \item We observed a propagating soft X-ray disturbance associated with an M1.4/1B flare which began at about 09:04 UT on 1997 November 03 at roughly 51\textdegree \textup{W} 18\textdegree \textup{N} in NOAA region 8100.
  \item The GOES soft X-ray flux for the flare is shown in Fig. 1 with superposed hatched areas representing the X-ray images of the active region at 09:06:36.9 UT on the same day, near the start of the flare.
  \item The soft X-ray disturbance was associated with a flare which began at about 09:04 UT on 1997 November 03. The GOES soft X-ray flux for the flare is shown in Fig. 1 with superposed hatched areas representing the X-ray images of the active region at 09:06:36.9 UT on the same day, near the start of the flare.
  \item The soft X-ray disturbance was associated with a flare which began at about 09:04 UT on 1997 November 03. The GOES soft X-ray flux for the flare is shown in Fig. 1 with superposed hatched areas representing the X-ray images of the active region at 09:06:36.9 UT on the same day, near the start of the flare.
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\textbf{Introduction}

Manifestations of large-scale solar coronal shock waves include type II radio bursts seen in dynamic radio spectropolarimetry (Wild 1985), propagating disturbances in the chromosphere, referred to as Moreton waves (Moreton 1961; Meyer 1988; Uchida 1988), transient propagating disturbances seen in 151 A images from the SOHO EIT (Mann et al. 1997), and in 195 and 171 A images from TRACE (Wills-Davey & Thompson 1999).

The poster by Hudson & Khan shows a large-scale shock wave observed in Yohkoh SXT data (Hudson & Khan 1997). Their evidence that the SXT features were not an X-ray plage is consistent with an event observed in SXT.

\textbf{Observations}

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  \item We observed a propagating soft X-ray disturbance associated with an M1.4/1B flare which began at about 09:04 UT on 1997 November 03 at roughly 51\textdegree \textup{W} 18\textdegree \textup{N} in NOAA region 8100.
  \item The GOES soft X-ray flux for the flare is shown in Fig. 1 with superposed hatched areas representing the X-ray images of the active region at 09:06:36.9 UT on the same day, near the start of the flare.
  \item The soft X-ray disturbance was associated with a flare which began at about 09:04 UT on 1997 November 03. The GOES soft X-ray flux for the flare is shown in Fig. 1 with superposed hatched areas representing the X-ray images of the active region at 09:06:36.9 UT on the same day, near the start of the flare.
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\textbf{Conclusions}

We have presented an analysis of observations of a bright, propagating disturbance seen in full-disc soft X-ray images of the Sun after the onset of a flare. Extrapolations indicate that the propagating soft X-ray disturbance is closely associated with an Hs-Moreton wave and an EIT wave.

\begin{itemize}
  \item Using Nanakay Radiodendrograph data we directly determined the source locations of the type II radio burst. We show that the type II radio bursts were located close to the Hs-Moreton wave, the EIT wave, and the SXT propagating disturbances at the times of these features. The NRH sources also show motions generally consistent with the motions for the propagating soft X-ray disturbance, both in terms of direction and approximate magnitude. We find the speeds of the NRH sources to be in the range 891–1564 km s\textsuperscript{-1}
\end{itemize}