



Astrophysics > Solar and Stellar Astrophysics

# Analysis of characteristic parameters of large-scale coronal waves observed by STEREO/EUVI

N. Muhr, A.M. Veronig, I.W. Kienreich, M. Temmer, B. Vrsnak

(Submitted on 5 Jul 2011 (v1), last revised 6 Jul 2011 (this version, v2))

The kinematical evolution of four EUV waves, well observed by the Extreme UltraViolet Imager (EUVI) onboard the Solar-Terrestrial Relations Observatory (STEREO), is studied by visually tracking the wave fronts as well as by a semiautomatized perturbation profile method leading to results matching each other within the error limits. The derived mean velocities of the events under study lie in the range of 220-350 km/s. The fastest of the events (May 19, 2007) reveals a significant deceleration of  $\approx -190 \text{ m s}^{-2}$  while the others are consistent with a constant velocity during the wave propagation. The evolution of the maximum intensity values reveals initial intensification by 20 up to 70%, and decays to original levels within 40-60 min, while the width at half maximum and full maximum of the perturbation profiles are broadening by a factor of 2 - 4. The integral below the perturbation profile remains basically constant in two cases, while it shows a decrease by a factor of 3 - 4 in the other two cases. From the peak perturbation amplitudes we estimate the corresponding magnetosonic Mach numbers  $M_{ms}$  which are in the range of 1.08-1.21. The perturbation profiles reveal three distinct features behind the propagating wave fronts: coronal dimmings, stationary brightenings and rarefaction regions. All of them appear after the wave passage and are only slowly fading away. Our findings indicate that the events under study are weak shock fast-mode MHD waves initiated by the CME lateral expansion.

Comments: Accepted for ApJ

Subjects: **Solar and Stellar Astrophysics (astro-ph.SR)**

Cite as: [arXiv:1107.0921v2](https://arxiv.org/abs/1107.0921v2) [astro-ph.SR]

## Submission history

From: Nicole Muhr [[view email](#)]

[v1] Tue, 5 Jul 2011 16:52:25 GMT (1462kb)

[v2] Wed, 6 Jul 2011 15:09:25 GMT (1462kb)

[Which authors of this paper are endorsers?](#)

## Download:

- [PDF](#)
- [PostScript](#)
- [Other formats](#)

Current browse context:

**astro-ph.SR**

[< prev](#) | [next >](#)

[new](#) | [recent](#) | [1107](#)

Change to browse by:

[astro-ph](#)

## References & Citations

- [INSPIRE HEP](#)  
([refers to](#) | [cited by](#))
- [NASA ADS](#)

Bookmark([what is this?](#))

