
Estimation of Plasma Properties and Magnetic Field in a Prominence-like Structure as Observed by SDO/AIA

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Abstract

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We analyze a prominence-like cool plasma structure as observed by Atmospheric Imaging As-
sembly (AIA) onboard the Solar Dynamics Observatory (*SDO*). We perform the Differential
Emission Measure (DEM) analysis using various filters of AIA, and also deduce the temper-
ature and density structure in and around the observed flux-tube. In addition to deducing
plasma parameters, we also find an evidence of multiple harmonics of fast magnetoacoustic
kink waves in the observed prominence-like magnetic structure. Making use of estimated
plasma parameters and observed wave parameters, under the baseline of MHD seismology,
we deduce magnetic field in the flux-tube. The wave period ratio $P1/P2 = 2.18$ is also ob-
served in the flux-tube, which may carry the signature of magnetic field divergence where
we estimate the tube expansion factor as 1.27. We discuss constraints in the estimation of
plasma and magnetic field properties in such a structure in the current observational per-
spective, which may shed new light on the localized plasma dynamics and heating scenario
in the solar atmosphere.

Keywords: prominence, like cool plasma structure, MHD seismology, density, temperature and
magnetic field, plasma parameters

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