


# Addendum to: Strength of the Solar Coronal Magnetic Field – A Comparison of Independent Estimates Using Contemporaneous Radio and White-Light Observations

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**Abstract** This addendum uses an alternate fit for the electron density distribution  $N(r)$  (see Figure 1) and estimates the coronal magnetic field using the new model. We find that the estimates of the magnetic field are in close agreement using both the models.

We have fit the  $N(r)$  distribution obtained from STEREO-A/COR1 and SOHO/LASCO-C2 using a fifth-order polynomial (see Figure 1). The expression can be written as

$$N_{\text{cor}}(r) = 1.43 \times 10^9 r^{-5} - 1.91 \times 10^9 r^{-4} + 1.07 \times 10^9 r^{-3} - 2.87 \times 10^8 r^{-2} + 3.76 \times 10^7 r^{-1} - 1.91 \times 10^6, \quad (1)$$

where  $N_{\text{cor}}(r)$  is in units of  $\text{cm}^{-3}$  and  $r$  is in units of  $R_{\odot}$ . The background coronal electron density is enhanced by a factor of 5.5 at  $2.63 R_{\odot}$  during the coronal mass ejection (CME). The estimated coronal magnetic field strength ( $B$ ) using radio data indicates that  $B(r) \approx (0.51 - 0.48) \pm 0.02$  G in the range  $r \approx 2.65 - 2.82 R_{\odot}$ . The field strengths for STEREO-A/COR1 and SOHO/LASCO-C2 are  $\approx 0.32$  G at  $r \approx 3.11 R_{\odot}$  and  $\approx 0.12$  G at  $r \approx 4.40 R_{\odot}$ , respectively.

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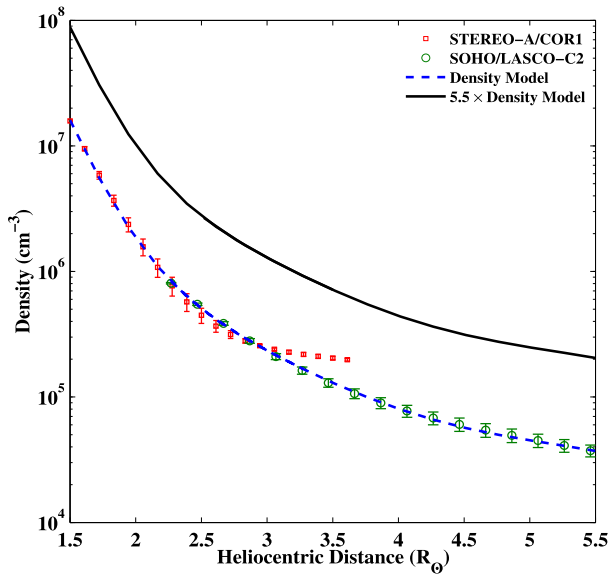
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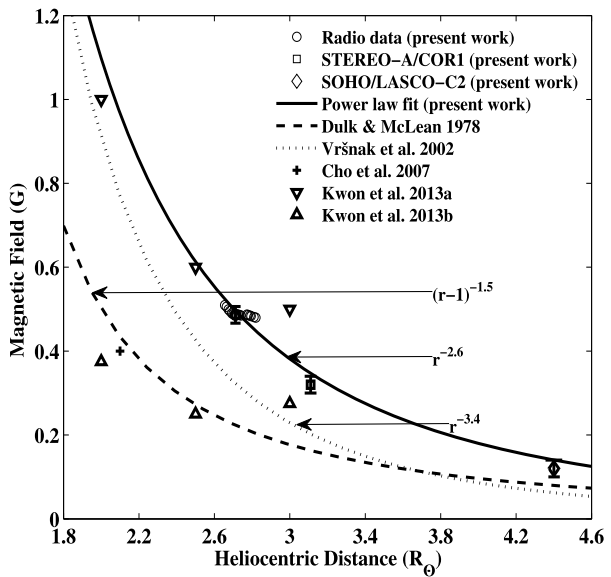
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**Figure 1** Estimates of  $N(r)$  in the background corona using pB measurements with the STEREO-A/COR1 ( $r \approx 1.5 - 3.7 R_{\odot}$ ) and the SOHO/LASCO-C2 ( $r \approx 2.3 - 5.5 R_{\odot}$ ) coronagraphs. The blue dashed line ( $r \approx 1.5 - 5.5 R_{\odot}$ ) is a fifth-order polynomial fit to the measurements of  $N(r)$  with these two instruments. The solid line in the same distance range represents  $5.5 \times$  the density values corresponding to the above fit. Note that this fit has excluded the COR1 data in the distance range  $r \approx 3.0 - 3.7 R_{\odot}$  because of large uncertainty caused by instrumental noise (Wang et al., 2017).



**Figure 2** Estimates of  $B(r)$  using band-splitting of the type II radio burst, and the shock standoff technique applied to the associated white-light CME observed with the STEREO-A/COR1 and SOHO/LASCO-C2 coronagraphs.



A single power-law fit,  $B(r) = 6.7r^{-2.6}$  G, to the magnetic field is sufficient to describe  $B(r)$  in the heliocentric distance range  $\approx 2.5 - 4.5 R_{\odot}$  (see Figure 2). Note that power-law index of  $B(r)$  obtained using Equation 1 is the same as the index reported in the article.

We have also included the error bars in the  $N(r)$  measurements from the white-light images (see Figure 1). The error in the density estimates is mostly due to the instrumental background subtraction and to the spherically symmetric approximation (Wang et al., 2017).

## References

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