Relations among solar wind speed, coronal magnetic field and photospheric magnetic field

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We can calculate three components of the conal magnetic field in any place in the corona by using so-called potential model with the observational data of photospheric magnetic field. On the other hand, we can estimate solar wind speed by using the data of cosmic radio scintillation from radio stars. We can study relations among the solar wind speed (V),

the photospheric magnetic field (Bp), and the coronal magnetic field (Bc). Arge and Pizzo, Hakamada et al, Hirano et al., and Wang et al., reported empirical formulae by which we can estimate V by Bp and Bc. In this paper, we use the data of V, Bp, and Bc from 13 Carrington rotations (CR 1830, CR 1844, CR 1855, CR 1870, CR 1887, CR 1898, CR 1901, CR 1909, CR 1925, CR 1939, CR 1950, CR 1964, CR 1976) in almost every year from the maximum phase of 22 solar activity cycle to the maximum phase of 23 solar activity cycle. The resultant relations between V, Bc, and Bp is reported.