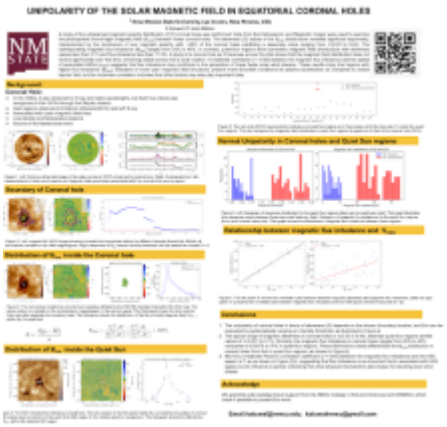
Khagendra
Katuwal
New Mexico State University
Dr. R.T. James McAteer, New Mexico State University
Poster
A study of the unbalanced magnetic polarity distribution of 70 coronal holes was performed. Data from the Helioseismic and Magnetic Imager (HMI) were used to examine the photospheric line-of-sight magnetic field (B_LOS) beneath these coronal holes. The skewness (S) of the B_LOS distributions reveals significant asymmetry, characterized by the dominance of one magnetic polarity, with approximately 88% of the coronal holes exhibiting skewness values in the range ±0.20 to ±0.40. The corresponding magnetic flux imbalance (Phi_imb) ranges from 20% to 45%. In contrast, quiet-Sun regions exhibit nearly symmetric magnetic field distributions, with |S| ? 0.11 and flux imbalance ? 11%. A study of an individual coronal hole as it traverses the solar disk shows that the magnetic field distribution remains stable over time, persisting across approximately half a solar rotation. A moderate correlation (r = 0.60) between magnetic flux imbalance and the speed of the associated high-speed solar wind streams (v_HSS) suggests that flux imbalance contributes to the generation of faster solar wind. These results imply that regions with higher flux imbalance, indicative of more open magnetic field configurations, provide more favorable conditions for plasma acceleration; however, the moderate correlation indicates that additional factors also play an important role.
Poster PDF
katuwal_khagendra.pdf


Presentation file
Katuwal-Khagendra.pdf
YouTube link
View recording
Meeting homepage
PUNCH 7 Science Meeting
Download Abstract