Abstract Submitted
for the DPP19 Meeting of
The American Physical Society

Electric Fields of the Sun and Solar Wind[1] C. FRED DRISCOLL, University of California, San Diego — A simple model of solar electric fields explains the solar wind energetics and coronal "heating", invoking only gravito-electric and photo-electric forces. In the (collisional) solar interior, gravity *necessarily* generates a radial electric field eE=(-1/2)m_pg, so protons are 50% levitated. At the surface, this gives eE(R_s) =1.4eV/Mm from displaced charge Q(R_s) = -75.Coul. In the (weakly collisional) outer photosphere/corona, electron scattering of the photon energy flux G_E gives eE = (G_E/c) $\sigma_{\gamma e}$. An estimated average photon-electron cross-section $\sigma_{\gamma e}$ =3x$10^{-24}$$m^2$ (typical of e-/p+ and e-/H correlations) gives eE=(4.eV/Mm) $(r/R_s)^{-2}$, sufficient to generate the observed solar wind: protons are accelerated out of the 2.keV gravity well and up to 1.3keV kinetic energy within several R_s, with total particle energy flux of $G_E/10^6$. This coherent proton/electron flow *is* the K-Corona, obviating the T=100eV hydrostatic model (Van deHulst, 1950). Filamentation (1.Mm^2) of the flow arises from the convection /recombination ("roiling") dynamics of surface granulations, with local electric fields generating strong currents and local magnetic fields. Statistical charge fluctuations, current filamentation, and neutral gas drag on the persistent proton/electron flow produces the pervasive *fluctuating* magnetic fields observed by spacecraft.

[1]Supported by AFOSR grant FA9550-19-1-0099

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Date submitted: 02 Jul 2019 Electronic form version 1.4