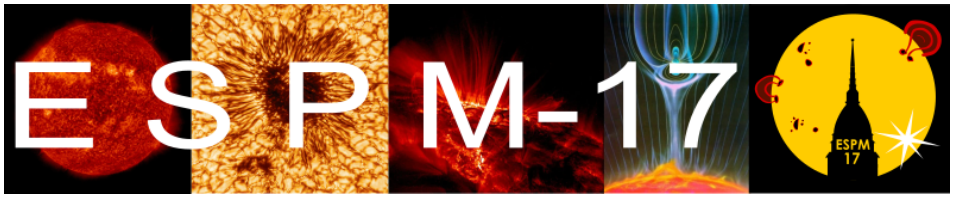

Contribution ID: **296** Type: **Poster**

Investigating the effect of statistically-averaged helicity condensation on ambient increase in the Solar Open Flux

A key problem faced by global models of the solar corona is a consistent underestimation of the amount of Open Flux. Recent studies have shown that introducing bipole twist or helicity condensation to non-potential global models can partially resolve this disagreement between simulated and measured values of the Solar Open flux. Here, we disentangle these effects to focus entirely on the extent of the contribution from helicity condensation to the Open Flux. We make use of global magnetofrictional simulations to model the amount of open flux and its spatial distribution over several solar cycles based on Kitt-Peak synoptic magnetograms. From this we show that statistically-averaged helicity condensation leads to both an ambient increase of Open Flux and a sporadic incease. Additionally, single-case analysis of the relationship between helicity condensation and open flux reveals some fine-detail behaviour that is otherwise obscured by the large-scale temporal analysis.

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Session Classification: Coffee break and poster session 2

Track Classification: Multi-scale energy release, flares and coronal mass ejections