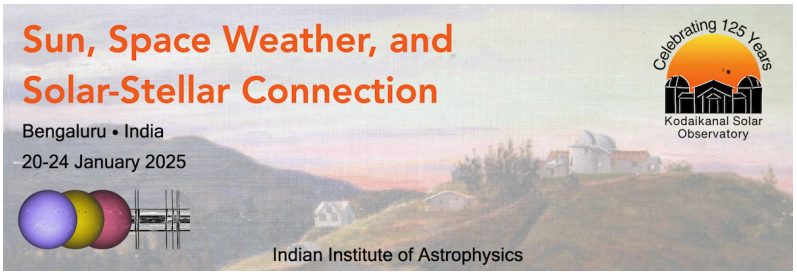

Contribution ID: **38** Type: **Poster**

Generation and annihilation of 3D nulls in a magnetic field initially devoid of any nulls

Three-dimensional (3D) magnetic nulls are abundant in the solar atmosphere, as have been firmly established through contemporary observations [1]. They are established to be important magnetic structures in solar atmosphere, for example, jets [2] and circular ribbon flares [3,4,5]. The flare emissions at the footpoints of the fan field lines constitute a closed circular flare ribbon. Recent simulations and extrapolations support this [6], the mechanisms behind 3D null generation remain an open question. Recent magnetohydrodynamics (MHD) simulations propose that magnetic reconnection is responsible for both generating and annihilating 3D nulls, where the initial magnetic fields already support preexisting nulls [7,8], raising the question whether magnetic reconnection can create nulls in the field initially devoid of them. For the purpose, the initially chaotic magnetic field devoid any nulls have been utilized for MHD simulations. The generation, annihilation, and dynamics of nulls are explored by a complementary usage of updated trilinear null detection technique and tracing of magnetic field line dynamics. It is found that the nulls can spontaneously generate/annihilate in pairs and the reconnection its being underlying cause. The simulation results also demonstrate a direct correlation between the chaoticity levels and the number of null generations, with higher chaoticity leading to earlier null creations and increased null count.
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Contribution Type

Theme

Energetic Phenomena

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