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Interaction between an emerging flux region and a pre-existing fan-spine dome observed by IRIS and SDO

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We present multi-wavelength observations of a fan-spine dome in the active region NOAA 11996 with the *Interface Region Imaging Spectrograph* (*IRIS*) and the Atmospheric Imaging Assembly on board the *Solar Dynamics Observatory* (*SDO*) on March 9, 2014. The destruction of the fan-spine topology owing to the interaction between its magnetic fields and an nearby emerging flux region (EFR) is firstly observed. The line-of-sight magnetograms from the Helioseismic and Magnetic Imager on board the *SDO* reveal that the dome is located on the mixed magnetic fields, with its rim rooted in the redundant positive polarity surrounding the minority parasitic negative fields. The fan surface of the dome consists of a filament system and recurring jets are observed along its spine. The jet occurring around 13:54 UT is accompanied with a quasi-circular ribbon that brightens in the clockwise direction along the bottom rim of the dome, which may indicate an occurrence of slipping reconnection in the fan-spine topology. The EFR emerges continuously and meets with the magnetic fields of the dome. Magnetic cancellations take place between the emerging negative polarity and the outer positive polarity of the dome's fields, which lead to the rise of the loop connecting the EFR and brightenings related to the dome. A single Gaussian fit to the profiles of the *IRIS* SI IV 1394 Å line is used in the analysis. It appears that there are two rising components along the slit, except for the rise in the line-of-sight direction. The cancellation process repeats again and again. Eventually the fan-spine dome is destroyed and a new connectivity is formed. We suggest that magnetic reconnection between the EFR and the magnetic fields of the fan-spine dome in the process is responsible for the destruction of the dome.