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On the response of the solar atmosphere to small-scale magnetic flux emergence

Santiago Vargas Dominguez (1) and Lidia van Driel-Gesztelyi (2,3)

(1) Universidad de los Andes, Bogotá, Colombia, (2) MSSL - University College London, UK, (3) LESIA - Paris Observatory, France

In this work we analyze data from the Hinode spacecraft targeting an emerging magnetic flux region. We focus on small-scale events identified by distinctive dark features in CaII H chromospheric filtergrams. Energy release at low chromospheric heights is detected to be boosted by the disappearance of the dark features after they reached their maximum size. The observed phenomena are explained as evidencing elementary flux emergence into the solar atmosphere. We are thus detecting granular-scale arch filament systems, that emerge and interact with pre-existing fields. The results give new insights on the resistive flux emergence scenario driving the configuration and evolution of solar active regions. We compare the results with emergence of individual magnetic loops seen in quiet sun regions.