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# Evolution of a Group of Coronal Holes Associated with Eruption of Nearby Prominences and CMEs

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## Abstract

We present the detailed study a set of activities developed on the solar disk during the period of February 07-13, 2012, based on multispectral analyze of ground-based and spacecraft (mainly STEREO/SDO) observations, including SDO/HMI magnetograms. This set involves the evolution of group of coronal holes (CHs), including the early stages of formation of one long-lived CH, two small active regions, the disappearance of various filaments (located within 20° distance from the boundary of CHs), and a pre- and post-evolution of several associated Coronal Mass Ejections (CMEs). We found the sequence of certain topological perturbations of whole CHs and their surroundings and the formation of a new CH associated with the emergence/disappearance of small magnetic dipoles (located between CH's boundary and prominences), that additionally is associated mostly with a post-evolution of prominences eruption and subsequent CMEs. Generally, we observe the emergence of magnetic dipoles associated with the formation of dimming regions and the disappearance of magnetic dipoles associated with the shrinkage of CHs, both processes throughout post-evolution of prominence eruption and CMEs. Moreover, the disappearance of magnetic dipoles, not directly linked to the post-evolution of prominences eruption and CMEs, states the formation of a new CH from the dimming region, which at the same time grows and reconnects with the other CH, becoming a large long-lived coronal hole. We discuss the possible small-scale magnetic reconfiguration as an explanation of these observational results.

**Keywords:** coronal hole, prominence, magnetic field, coronal mass ejection

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