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Long-Term Tracking of Corotating Density Structures Using Heliospheric Imaging (catalogue of CIRs during 2007-2014)

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The systematic monitoring of the solar wind in high-cadence and high-resolution heliospheric images taken by the *Solar-Terrestrial Relation Observatory* (STEREO) spacecraft permits the study of the spatial and temporal evolution of variable solar wind flows from the Sun out to 1 AU, and beyond. As part of the EU Framework 7 (FP7) Heliospheric Cataloguing, Analysis and Techniques Service (HELCATS) project, we have generated a catalogue listing the properties of more than 190 corotating structures well-observed in images taken by the *Heliospheric Imager* (HI) instruments on-board STEREO-A (ST-A). Based on this catalogue, we present here one of very few long-term analyses of solar wind structures advected by the background solar wind. We concentrate on the subset of plasma density structures clearly identified inside corotating structures. This analysis confirms that most of the corotating density structures detected by the heliospheric imagers comprises a series of density inhomogeneities advected by the slow solar wind that eventually become entrained by stream interaction regions. We have derived the spatial-temporal evolution of each of these corotating density structures by using a well-established fitting technique. The mean radial propagation speed of the corotating structures is found to be 311 ± 31 km s^{-1}. We show that the speeds of the corotating density structures derived using our fitting technique track well the long-term variation of the radial speed of the slow solar wind during solar minimum years (2007–2008). Furthermore, we demonstrate that these features originate near the coronal neutral line that eventually becomes the heliospheric current sheet.