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How common are counter Evershed flows?

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The Evershed flow is one of the most outstanding features observed in sunspot penumbrae. It is a plasma flow running along penumbral filaments radially outwards and towards the moat of sunspots. This flow was first observed more than a century ago. Nevertheless, in the past decade, observations have shown unusual *counter* Evershed flows (CEFs) that run in the opposite direction, towards the sunspot umbra. Until now, very few CEFs have been reported. Thus, CEFs are still thought to be extremely rare events. In this work, we followed 97 active regions for an average of 9.6 days using SDO/HMI observations. Our sample includes various types of sunspots, from the most simple α -spots to the more complex δ -groups of sunspots. We report the detection of 384 CEFs, showing that CEFs are far more frequent than their rarity in the literature suggests. However, CEFs are still sparse as they are observed in just 5.9% of the average observed time. We explain that the small number of reports of CEFs was due to incomplete coverage of active regions, which was overcome by continuous observations taken from space.

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