Coronal Rain - the 6th Coronal Heating Constraint ?

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So far, observations have pointed out five characteristics of warm loops ($\sim$ 1 MK) in active regions, which any coronal heating model must explain. Namely, an excess density, a flat temperature profile, a super-hydrostatic scale height, an unstructured intensity profile, and a 1000-5000 s lifetime. Coronal rain, a spectacular phenomenon of active regions in which plasma in coronal loops dramatically cools down to chromospheric temperatures and falls down from coronal heights, has been shown to be deeply linked to the underlying heating agent, thus acting as a marker for the coronal heating mechanism. In this study we analyze high resolution observations of coronal rain in Ca II H and Hα performed by the *Hinode*/SOT and by Crisp of *SST*, respectively. A large number of loops exhibiting coronal rain are analyzed and interesting statistical properties are derived. Results show that coronal rain is a more common phenomenon than previously thought. The observed properties of coronal rain also imply important characteristics about the coronal heating mechanisms, which leads to the possibility of considering coronal rain as the 6th coronal heating constraint.

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