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Application of newly short-scale Palmer drought severity index for flash drought detection

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Due to the devastating socio-ecological impacts, flash droughts with rapid onset and strong intensity, have attracted much attention in recent literatures. One major obstacle in term of current flash drought related researches is the lack of refined monitoring tools to depict moisture stress conditions. By modifying the algorithm of duration factors estimation in the self-calibrating Palmer drought severity index (SC-PDSI), the traditionally long time scale of SC-PDSI was altered into short scale. Then the capability of the newly proposed SC-PDSI at short time scales in monitoring two categories of flash droughts (heat wave and precipitation deficit induced flash drought) was assessed over 134 meteorological sites in China during 1951-2012. Results show that the new index is sensitive to moisture fluctuations and is capable to capture the dynamics of heat wave and precipitation deficit induced flash droughts, with a slightly better performance for the latter. Besides, a general increased tendency is observed for the occurrences of flash drought, and the middle and eastern parts of China are high-occurrence regions which are more vulnerable to flash droughts.