

# **Rainfall estimation from Kalpana-1 satellite data over Indian land and oceanic regions**

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## **Abstract**

Rainfall, an integral component of the global water and energy cycle, is one of the critical weather elements. Reliable information of rainfall over India is crucial for food security and sustainable economic growth. The first Indian dedicated meteorological geostationary satellite Kalpana-1 was launched by the Indian Space Research Organisation in late 2002 to study the synoptic weather systems, monsoons and extreme weather events. Various geophysical parameters derived from this satellite measurements are operational and used for a wide range of applications. Two rainfall products, based on distinct algorithms, from this satellite are also available to users. These two algorithms after certain refinements are also applied to the recently launched INSAT-3D satellite measurements to estimate rainfall. In this article, the algorithms used for the development of these Kalpana-1-based rainfall products are summarized. The assessment of these rainfall products against standard multisatellite datasets and *in situ* observations are also outlined. Both the rainfall products are comparable with independent multisatellite datasets and have reasonable agreement with ground-based observations over the Indian land and oceanic regions. Limitations of these rainfall products are also presented; and future scope for further refinement of these products in perspective of upcoming Indian geostationary satellite missions is proposed.