A NEW ALGORITHM TO DETECT PRECIPITATION ZONES IN THE CARIBBEAN USING GEOSTATIONARY AND POLAR SATELLITES.

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One of the greatest difficulties in the study of hydrometeorology is to achieve more accurate estimates of rainfall intensity and accumulation, using analysis of satellite data. Over the years, several models have been developed to detect rain rate at regional and global scale based on geostationary and polar satellites. These algorithms have proven to be effective in detecting potential rain zones. However, these models greatly fail in the detection of precipitation zones for short-term rainfall events, both locally and regionally, especially in the Caribbean area. Therefore, despite the progress made in rainfall estimation models, there are still great opportunities to improve detection based on a better identification and characterization of potential rain formation zones.

Our work consists in introducing a new algorithm that will improve the detection of potential precipitation zones for the Caribbean region using geostationary satellite information. The main focus of the proposed model is to reduce the rain rate detection errors. The identification of potential rain zones is determined in terms of several cloud microphysics properties. The proposed model will be supported by products related to clouds microphysics derived from polar satellites (AQUA and TERRA) and the geostationary satellites (GOES-13 and GOES-16). Some of the proposed indicators are: (1) cloud optical thickness (COD), (2) droplets effective radius (CER), and (3) cloud water path (CWP). In addition, absorption and reflection optical properties of the visible and infrared bands will be used to identify the rainy areas. Some of the optical properties that will be used are the visible reflectance (VR) and albedo of the near infrared channel (AL).