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Multiple Instrument Studies of Chemical Releases and Heating at Arecibo

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Abstract: The Combined Releases and Radiation Effects Satellite (CRRES) Puerto Rico experiments carried out during June and July 1992, provided an opportunity to observe the dynamics and evolution of high-altitude chemical releases at middle latitudes. Among the experiments that were conducted for the program, three large barium payloads were released into the dawn F region -- two into the natural ionosphere and one into an ionosphere modified by HF heating. Extended periods of HF **modification** prior to the rocket launches also provided an opportunity to study heating effects, per se. This report reviews some preliminary results from three participating instruments: (1) ion-line mapping made by the Arecibo incoherent scatter radar, (2) HF backscatter characterization and tracking of the barium **cloud**, and (3) transionospheric propagation diagnosis of large and medium scale structure produced by heating and the barium releases. The data that are reviewed are primarily observational and are presented with a minimum of physical interpretation. Recommendations are made for further analysis of much of the data. jg

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