level of auroral activity during the impact week do not show any large scale changes in the auroral system. We do, however, note that the level of south auroral activity is somewhat suppressed relative to the north and the historical archive. Further review of the spectra from before and after the impact period is necessary to determine if this effect is related to the impacts. Lastly, we present the detection of significant UV emission from the area of the K impact event. The intensity of the emission suggests a non-thermal process, however further study of the spectral character of the emission, along with study of spectra from other impact sites will be necessary to isolate the source in detail.

JUPITER'S SYNCHROTRON RADIATION THROUGHOUT THE COMET P/SHOEMAKER-LEVY 9 IMPACT PERIOD

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Jupiter's microwave emission was observed throughout the SL9 impact period by many different telescopes, among which the NRAO 140-foot telescope in Green Bank (21 cm), Westerbork (92 cm), Effelsberg (6, 11 cm), Parkes (21 cm), NASA DSN (13 cm), and the Very Large Array (22, 90 cm). We determined the "average" total nonthermal flux density from the planet after having subtracted the thermal contribution, following the formulation by de Pater and Klein, (1989) and Klein et al., (1989). The flux density increased typically by 40–50% at 6 cm wavelength, 27% at 11-13 cm, 22% at 21 cm and 10–15% at 90 cm. Thus the radio spectrum hardened considerably during the week of cometary impacts. Following the week of cometary impacts, the flux density began to subside at all wavelength.

VLA images show the brightness distribution of the planet; a comparison of images taken before and during the week of impacts show marked changes in the brightness distribution. At a central meridian longitude $\lambda_{III} \approx 110°$, the left side of the belts increased considerably and moved inwards by ~ 0.2 R_J. This suggests that the increase in flux density is caused by energization of the resident particle population.

For more details on the variation in flux density and in the brightness distribution, the reader is referred to de Pater et al., "The Outburst in Jupiter's

Synchrotron Radiation Following the Impact of P/Comet Shoemaker-levy 9", submitted to Science.

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REVIEW OF THE CALAR ALTO COMET CAMPAIGN

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A collaboration of more than a dozen astronomers from seven different countries came together to observe the ten fragment impacts visible from the Calar Alto Observatory in Spain. The weather was excellent, and the team acquired data on each of the A, E, H, L, P2, Q2, Q1, S, T, and U impacts.

The observers at the 3.5 m telescope (Herbst, Hamilton, Böhnhardt, Ortiz–Moreno) conducted an intense program of near infrared imaging and spectroscopy using the MAGIC infrared camera. MAGIC contains a 256$\times$256 HgCdTe detector array and is sensitive between 1 and 2.5 μm. All impacts were detected, except P2, T, and U. Light curves in the 2.3 μm absorption band of CH_4 show precursor flashes for the A (see figure 1), H, L, Q2, and Q1 impacts. In the case of Q2, the precursor was comparable in brightness to the main peak of emission 7 minutes later, and in the case of the H and L impacts, careful reduction of the data after the IAU colloquium showed that the precursors were double. Hamilton et al. discuss the nature of these precursors in a companion abstract in this volume. The MAGIC camera has motorized slits and grisms, allowing the team to switch to spectroscopy mode within $\sim$30 seconds. Spectral sequences taken during the main brightness peaks of the H and L impacts show strong emission features from the $\Delta v = 2$ bandhead emission of CO. These bandheads indicate the presence of hot $\sim$2000 K molecular

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