



## **HiRISE observations of gas sublimation-driven activity**

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The High Resolution Imaging Science Experiment (HiRISE) onboard Mars Reconnaissance Orbiter (MRO) has been used to monitor the seasonal evolution of several regions at high southern latitudes and, in particular, the geyser-like activity which may result from the process described by Kieffer [JGR, 112, 8005, 2007] involving translucent CO<sub>2</sub> ice. Here, we mostly concentrate on observations of the Inca City (81S, 296E) region.

The observations indicate rapid on-set of activity at the beginning of southern spring with activity initiating before HiRISE can obtain adequately illuminated images ( $L_s < 174$  at Inca City). Most sources became active within the subsequent 8 weeks. Activity is indicated by the production of dark deposits surrounded by brighter bluer deposits which probably arise from the freezing out of vented CO<sub>2</sub> [Titus et al., AGU Abstract P41A-0188, 2007]. These deposits originate from araneiform structures (spiders), stones on ridges, cracks on slopes, and along linear cracks in the slab ice on flatter surfaces. The type of activity observed can often be explained qualitatively by considering the local topography. Some dark fans were observed to shorten enormously in length on a timescale of 18 days. We consider this to be strong evidence that emission was in progress at the time of HiRISE image acquisition.

The orientations of surficial deposits were mostly topographically controlled in Inca City in 2007. The deposition of dark material also appeared to be influenced by local topography suggesting that the ejection from the vents was at low velocity ( $< 10$  m/s) and that a ground-hugging flow type process (a sort of cryo-fumarole) may have been occurring.

The presentation will illustrate the above features and make a first comparison between activity separated by one full Martian year. Our first observations indicate a stronger influence of wind in 2009.