

DUST MORPHOLOGY OF COMET HALE-BOPP (C/1995 01) IN 1996:

II. INTRODUCTION OF A WORKING MODEL

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A Monte Carlo computer code for the image simulation of dust features in comets is applied to comet Hale-Bopp to model the object's persisting porcupine-like appearance on high-resolution images taken between May 11 and November 2, 1996. A self-consistent model is offered by postulating four isolated sources of dust emission at various locations on both polar hemispheres of the rotating nucleus, whose spin axis suggests a complex motion in an inertial coordinate system. The observed jets and/or jet pairs represent boundaries of fan-shaped formations described by dust ejected from the sources during periods of time when the Sun was above the local horizon. The spin axis is found to travel through a field of 10° by 20° during the examined period of nearly six months. The results are insensitive to the rotation period, but the observed morphology can generally be expected to be more prominent for a rapidly rotating comet.