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The Contribution of Methanol to the 3.4 μm Feature in Comets.

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With the advent of improved detectors and improved moderate resolution spectrometers (resolving powers ~100 to 1000) several interesting features have been seen in the infrared spectra of comets. In particular, an emission excess at 3.52 μm has been observed in several comets, and has recently been tentatively assigned to the ν_3 band of methanol (CH_3OH) (Hoban et al, 1991). Assuming this assignment is correct, there should be a factor of 3 to 4 more emission centered around 3.35 μm due to the ν_2 and ν_9 bands of this molecule. Using a model we have developed ,we can calculate the relative strengths of the CH_3OH features. This is illustrated in the figure below for a rotational temperature of 50 K assuming Haser outflow. Thus, part of the well known 3.4 μm "organic grain" feature may be attributable to methanol. In this paper we shall use the 3.52 μm emission strengths in a number of comets to retrieve methanol amounts, and then use our model to predict the fraction of the 3.4 μm flux which is contributed by the species. Implications for cometary formation shall be discussed.

References: Hoban et al., Icarus, 1991, *submitted*