OH OBSERVATION OF COMET KOHOUTEK (1973f) AT 18 CM WAVELENGTH*

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ABSTRACT

The main lines of OH at 18 cm wavelength were observed in Comet Kohoutek (1973f) from December 1973 through February 1974 with the Nancay radio telescope. They were detected in absorption in early December and reappeared in emission around mid-January. In a preliminary approach these results are interpreted in terms of U.V. pumping by the sum when the Fraunhofer spectrum is taken into account.

*See Astron. and Astrophys. 34, 163(1974) for the complete text.

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W. F. Heubner: What was the full width at half amplitude?

E. Gerard: Four kilometers per second; plus or minus one. (OH obs. at 18 cm.)

Voice: Would you tell more about Turner's observations that were made at the same time?

E. Gerard: Yes.

Voice: Could you compare the column densities?

E. Gerard: The problem is that he made a different interpretation, right, because he didn't assume there was some kind of maser going on there. So, he ended up with a very high column density. It was around 10^{14} per centimeters squared. Now, I will bet you it is off by almost two orders of magnitude, when we see what the column densities are that Arpigny has been talking about.

If you take Turner's numbers and interpret them in terms of the maser mechanism the column density averaged over the Green Bank beam is $1.4\ 10^{12}$ which is just okay: We find for the first period $3.3\ 10^{12}$ and for the second $4.1\ 10^{12}$.

The problem is that we have been fighting hard to make purely radio astronomy measurements of the OH cloud without mixing up with the optical people. We try to, reconcile it afterwards and it fits all right.

D. J. Malaise: Referring to your last slide, comparison of the computation based on the fluorescence process and your observation, it was striking how nice it fitted, but you mentioned that this signal disappeared just before perihelion, and I take it that really the signal should have been there. Its absence is real, bars are small, correct?

E. Gerard: Yes.

D. J. Malaise: So, of course, it might be a shrinking of the OH region with the higher dilution, but anyhow, it means that the total amount of OH just got down.

E. Gerard: Yes. Definitely.

D. J. Malaise: OH disappeared in the head in some way. So, this is a very important point of—

M. Dubin: On the same point as Malaise, I have some of the information from the Page and others' measurement of Lyman alpha versus time, the total hydrogen. And they observed what appears to be an increase in the hydrogen emission in the period from the 3rd of December through about December 15th, and then a major decrease.

Now, supposedly there is a relationship with the hydroxyl density and it is rather important to find out if in addition to the masering, whether there is a change in the total hydroxyl in the comet.

E. Gerard: So, you are saying it went down around the 16th, or sometime like that?

M. Dubin: Yes.

E. Gerard: The H signal?

M. Dubin: Yes. Lyman alpha.

Voice: We have an increase and a decrease following it, and it is not a monotonic function with radial distance, which appears to be confirmed in your measurements in your last slide.

E. Gerard: Provided you believe in the maser gain stuff.

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