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We present sub-millimeter observations of the ground-state rotational transition (110–101) of water vapour from comet C/2002 T7 (LINEAR) obtained with the MIRO Instrument on the ESA Rosetta Spacecraft (s/c) Orbiter on April 30, 2004, which is about 7.5 days after its perihelion. The comet was at a distance of 0.63 AU from the Sun and 0.68 AU from the s/c at the time of the observations. The Doppler velocity of the comet relative to the s/c was -72.585 km/s. The ground state rotation transition of ortho-water at 556.936 GHz was observed and integrated for ~ 8 hours using a frequency switched radiometer to provide short and long term stability. MIRO beam size is 7.5 arcmin in terms of full width half maximum, corresponding to a width of 2.2×10^5 km at the location of the comet. The observed signal line area of the water line spectrum is 4.26 ± 1.17 K km/s, leading to the signal to noise ratio of 3.64. Using a molecular excitation and radiative transfer model and assuming the spherically symmetric and constant radial expansion of gas in the coma, we estimate that the production rate of water is $(7.0 \pm 0.2) \times 10^{29}$ molecules/s and the expansion velocity is 1.0 ± 0.2 km/s at the time of the MIRO observation. The present estimation of the water outgassing rate of the comet is in good agreement with other observation-based estimations when the outgassing rates with respect to the time after perihelion are compared.

505.06 – A Search For $^{15}\text{NH}_2$ Emission Lines In Comets

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The determination of nitrogen isotopic ratios in solar system objects is important for a good understanding of their origin. The measurements of $^{14}\text{N}/^{15}\text{N}$ isotopic ratio done so far in various solar system objects and molecules have revealed a great diversity (from 50 to 441), all of them, except Jupiter, being enriched in ^{15}N compared to the protosolar nebula. Different explanations have been proposed to explain this enrichment. One of them suggests that these differences reflect the different interstellar N reservoirs from which N-bearing molecules are originating (Hily-Blant et al., 2013). These authors, from observations of H^{13}CN and HC^{15}N in two prestellar cores, suggest that the molecules carrying the nitrile- ($-\text{CN}$) functional group would be more enriched in ^{15}N than the molecules carrying the amine ($-\text{NH}$) functional group. Comets are interesting targets to test this theory because they contain both HCN and NH_3 molecules. So far the $^{14}\text{N}/^{15}\text{N}$ ratio has only been measured in CN (Arpigny et al., 2003; Manfroid et al., 2009) and HCN (Bockelée-Morvan et al., 2005, 2008) in comets, leading for both species to $^{14}\text{N}/^{15}\text{N} \approx 150$. Our work aimed at measuring the $^{14}\text{N}/^{15}\text{N}$ isotopic ratio in NH_2 , which comes from NH_3 . We have determined accurately the wavelengths of $^{15}\text{NH}_2$ emission lines with the AILES beamline spectrometer at synchrotron SOLEIL by Fourier transform spectroscopy. The analysis of this spectrum has permitted to extract the $^{15}\text{NH}_2$ emission lines wavelengths and to search for $^{15}\text{NH}_2$ cometary emission lines. Thanks to a collection of spectra of 12 different comets obtained from 2002 to 2011 with the UVES spectrometer at the VLT ESO 8-m telescope (Manfroid et al., 2009), it has been possible to search for $^{15}\text{NH}_2$ emission lines with a high sensitivity. We will present the results obtained from these data. Arpigny et al., *Science*, **301**, 1522-1525, 2003 Bockelée-Morvan et al., in *Comets II*, ed. M. C. Festou, H. U. Keller, & H. A. Weaver (Tucson: Univ. Arizona Press), 391-423, 2005 Bockelée-Morvan et al., *ApJ*, **679**, L49-L52, 2008 Hily-Blant et al., *Icarus* **223**, 582-590, 2013 Manfroid et al., *A&A*, **503**, 613-624, 2009

505.07 – FUV spectroscopy of the comet C/2001 Q4 (NEAT) with FIMS

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We present the results of far-ultraviolet (FUV) observations of comet C/2001 Q4 (NEAT) obtained with Far-ultraviolet Imaging Spectrograph (FIMS) on board the Korean microsatellite STSAT-1, which operated at an altitude of 700 km in a sun-synchronous orbit. FIMS is a dual-channel imaging spectrograph (S channel 900-1150 Å, L channel 1350-1750 Å, $\lambda/\Delta\lambda \sim 550$) with large image fields of view (S: $4^\circ.0 \times 4^\circ.6$, L: $7^\circ.5 \times 4^\circ.3$, angular resolution $5' - 10'$) optimized for the observation of diffuse emission of astrophysical radiation. Comet C/2001 Q4 (NEAT) was observed with a scanning survey mode when it was located around the perihelion between 8 and 15 May 2004. Based on the scanning mode observations in the wavelength band of 1400 - 1700 Å, we have constructed the image of the comet for an angular size of $5^\circ \times 5^\circ$, corresponding to the central coma region around the nucleus. Several important fluorescence emission lines were detected such as S I triplets at 1429 and 1479 Å, C I lines at 1561, 1657 Å, and the CO A¹ π -X¹ σ^+ Fourth Positive system, and we have estimated the production rates of the corresponding species from the fluxes of these emission lines. We estimated average production rates of CO, C by the photodissociation of CO, S by S I 1429 Å triplet, and S by S I 1479 Å triplet. We found existence of short-lived parent molecule of C atom in small cometocentric distances comparing the