

Spectrophotometric researches of the cometary comae C/2014 Q2 (Lovejoy) and C/2013 US10 (Catalina)

Ponomarenko V.A.,¹ Churyumov K.I.,¹ Simon A.O.²

¹ *Taras Shevchenko National University of Kyiv*

² *Main Astronomical Observatory of National Academy of Science of Ukraine, Kyiv, Ukraine*

vasiliyponomarenko@gmail.com

Have been presented the observations and researches of the long periodic comets C/2014 Q2 (Lovejoy) and C/2013 US10 (Catalina) on the basis of optical spectra with an average resolution ($\lambda/\Delta\lambda \approx 1200$) in the wavelength range $\lambda\lambda = 3600\text{--}7700 \text{ \AA}$. The spectra were obtained in February and December 2015 with the help of the telescope AZT14 ($D = 0.48 \text{ m}$, $F = 7.7 \text{ m}$) and the spectrograph ASP-9 at the station Astronomical Observatory of Taras Shevchenko National University of Kyiv “Lisnyky”. At the time of the observations, the comet C/2014 Q2 was at the heliocentric distance $r = 1.32 \text{ AU}$ and the geocentric distance $\Delta = 1.09 \text{ AU}$, had the integral magnitude $T = 5.2\text{m}$, the elongation angle was $(S\text{--}O\text{--}T) = 78^\circ$, the phase angle - $(S\text{--}T\text{--}O) = 47^\circ$ and position angle - 55° . Comet C/2013 US10, at the time of the observations, was at the heliocentric distance $r = 1.08 \text{ AU}$ and the geocentric distance $\Delta = 1.06 \text{ AU}$, had the integral magnitude $T = 6.5\text{m}$, the elongation angle was $(S\text{--}O\text{--}T) = 64^\circ$, the phase angle - $(S\text{--}T\text{--}O) = 55^\circ$ and position angle - 300° . On the basis of obtained spectral material was carried out the identification of spectral emission bands and separate lines. Using Haser and Shulman models were calculated some physical parameters of neutral gaseous and dust cometary comae. The distributions of general and reflected energy along the slit of the spectrograph have been built. Fluxes, the number of molecules, gas productivity and lifetime for basic molecular emissions (CN, C3, C2), relative dust productivity (Afp) and solar continuum have been calculated.
