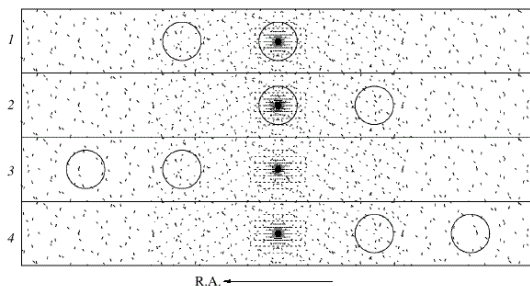


OBSERVATIONS OF THE COMETS IN NEAR INFRARED. LIFE: FROM THE COMETS TO THE EARTH. I. A. Maslov. Space Research Institute RAS, ul. Profsoyuznaya 84/32, Moscow, Russia, GSP-7, 117997. E-mail: imaslov@iki.rssi.ru.

Observations: Photometric observations of the comet C/2004 Q2 (Machholz) were spent from December 2004 to April 2005 on 1.25-m telescope at Crimean Laboratory of Moscow Sternberg Astronomical Institute (Crimea, Ukraine) in five standard infrared bands: JHKLM. The measurements were spent at four positions of a diaphragm (diameter 12 arc sec) of a photometer concerning the center of a comet. Two zones of sensitivity at distance 20–40 arc sec arise because of internal modulation in a photometer. The result is difference of signals from these zones.



Data: The presented data [1] show, that: (1) the coma in the central part can have smaller brightness than on periphery. (2) Correlation between signals in zones with delay day and more from the center to periphery is observed.

Approximations: We approximated our data by the sum of the scattered and thermal radiations:

$$B_{\lambda} = E_{\lambda_0} / \pi * A_{1.65} (1.65/\lambda)^{\alpha} + P_{\lambda}(\lambda, T_{\#}) * Q_{4.7} (4.7/\lambda)^{\beta},$$

where B_{λ} – spectral brightness, E_{λ_0} – solar illumination near the comet, $A_{1.65}$ – coefficient of brightness (albedo) at 1.65μ , λ – wavelength, $P_{\lambda}(\lambda, T_{\#})$ – Planck's function, $Q_{4.7}$ – optical thickness at 4.7μ , α, β – constants. Dust particles heat up to equilibrium temperature $T_{\#}$:

$$4 * T_{\#}^{4+\beta} R_{\#}^2 = T_0^{4+\beta} R_0^2,$$

where $T_0 = 5770$ K – effective temperature of the Sun, $R_{\#}$ – distance of a comet from the Sun, R_0 – radius of solar photosphere.

Results: The comet lost substance in the form of cold large fragments ($\alpha = 0.17 \pm 0.20$) which were divided into gas and a small dust particles ($\beta = 0.99 \pm 0.19$) for a day and longer. Speed of fragments exceeded 0.3 km/s. It shows that the comet has friable structure.

Definition: The parameter of the life: (1) Occurrence of a life is improbable event; (2) if the life arises, its disappearance is improbable, too. These two probabilities define life-parameter of structure or the phenomenon. One of ways of stability is self-reproduction. In this case the life-parameter is not large for one element but large for set of the elements. The Earth – an oasis for a terrestrial life. Here a lot of vital structures, they intensively compete among themselves – natural selection. As result of it – existence of the structures with unique life-parameter.

Hypothesis: Self-reproduction molecules have arisen on a surface of comets, and have been protected by new external layers. Basis for this hypothesis: (1) the structure of comets surface at epoch of its forming is friable; (2) stochastic formation of molecules on cold particles of the complex form is very effective [2]; (3) terrestrial oceans are forming of due to falling the comets [3].

Fantasy: Probably, at the first stage of occurrence of a life, liquid water is harmful. This stage passes at the low temperatures and during long time – scale of 10^9 years. On the Earth were suitable conditions for the self-reproduction molecules and their number was multiplied up to such degree that natural selection has begun at the time-scale of 10^6 years.

Conclusion: The terrestrial life has arisen at the Ocean, but when on the Earth there were adverse conditions this Ocean was on periphery of Solar system or further away.

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References: [1] Maslov I. A. et al. (2008) *Astronomy Letters*, 34 (in press). [2] Pyarnpuu A. A. and Shematovich V. I. (2000) *Mathematical Modeling*, 12, 22–26 (in Russian). [3] Morbidelli A. et al. (2000) *Meteoritics & Planet. Sci.*, 35, 1309–1320.