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The peculiarities in Ia supernovae redshift distribution obtained due preliminary studies results of the Open Supernova catalogue data

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The interest of the scientific community on supernovae (SNe) has increased in the recent years for several reasons. Mostly they are the advances in the understanding of the SN phenomena obtained with the intensive study of nearby SNe, first of all SN 1987A, which have raised new more fundamental questions with regard to progenitor evolution, explosion mechanism and nucleosynthesis. The Open Supernova Catalog (OSC) is an online dataset contains metadata and observational results for approximately 10^5 supernovae. The preliminary results of OSC data analysis show that several peculiarities are presented in Ia supernovae redshift distribution. The deviation in the band $0.015 < z < 0.13$ contain more faint supernovae. Two peculiarities also were found in the region $0.25 < z < 0.45$ on data of this catalogue. One of its contain more faint events, other contain more bright supernovae. Also $faint_m$ and $bright_m$ supernovae areas could be separated by $m_{fb} \sim 20$ in distribution of object amount on apparent magnitude. The distribution of SNIa on apparent magnitudes and angular distance to host center also reveal two areas (faintdist and brightdist objects) and ratio between these regions populations is different for different subsamples in OSC (Pan-STARRS1 (PS1) Medium Deep Survey, ASASSN and so on). Also within one host galaxy apparent magnitudes of SNIa could differ for $m_{onehost} \sim 2.5$ (for example, in UGC03432). Two supernovae SN2016jdv and SN2018qp located in IC988 with redshift $z = 0.0269 \pm 0.0002$ at angular distances to host center $\phi_{SN2016jdv} = 5.84$ and $\phi_{SN2018qp} = 7.88$ has $m_{onehost} \sim 0.4$. Moreover, the optical spectra of these supernovae are similar and show no absorption lines that would indicate the absorption of light from a fainter object; thus, the difference $m_{onehost} \sim 0.4$ for the galaxy IC988 is caused by some other effect. The observed features and inhomogeneities cannot be explained by the differences between the single-degenerate and double-degenerate explosion scenarios for Type Ia supernovae based on standard nuclear reaction models. Furthermore, the hypotheses regarding a reduction in SN Ia flux due to interaction with the surrounding medium are unsupported by the absence of specific absorption lines in the energy spectra of the analyzed events. Consequently, the presence of such features is likely attributable to variations in the properties of the Metagalaxy at high redshifts or to unknown aspects of Type Ia SN explosion scenarios, leading to sample inhomogeneity. Moreover, the H_0 tension effect could be caused due differing ratios of faint to bright SNe Ia within the analyzed subsamples.

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