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Observations of the long time activity of the distant comets 29P Swassmann-Wachmann 1, C/2003 WT42 (LINEAR) and C/2002 VQ94 (LINEAR)

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Abstract

We investigated comets active at large heliocentric distances using observations obtained at the 6-m BTA telescope (SAO RAS, Russia). Photometric mode of the focal reducer SCORPIO was used. Three of the comets, 29P/Schwassmann–Wachmann 1, C/2003 WT42 (LINEAR) and C/2002 VQ94 (LINEAR) were observed after the perihelion passage at heliocentric distances between 5.5 and 7.08 AU. The dust production rates in terms of $Af\rho$ was measured for these comets. Using the retrieved values an average dust production rate was evaluated under the different model assumptions. A tentative calculation of the total mass loss of the cometary nucleus within a certain observation period was executed. We calculated corresponding thickness of the depleted uppermost layer where high-volatile ice completely sublimed. Obtained results strongly support the idea that observed activity of the comet SW1 needs permanent demolition of upper surface layers.