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Metall abundances of 2004 Geminid meteor spectrum: Extremely Na depletion?

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This paper shows the first result of a Geminid meteor spectrum in visible – ultraviolet region. Wavelengths between 300-600nm were observe on the meteor appeared at 17h41m245 UT on 2004 December 14 UT, and the strong emissions of neutral atoms such as mainly MgI, FeI,CaI and NaI were identified. The abundances of metallic atoms, their excitation temperature were obtained under the Local Thermal Equilibrium (LTE) conditions.

The results suggest the possibility that the abundances of Geminid meteor are slightly different from the solar abundances. Na/Mg = 0.0036, which is extremely lower than the other meteor showers. On the other hand, our firstly derived Ni/Mg of Geminid meteor is 0.078, which is larger than the solar abundance, and that of meteors of other showers. The excitation temperature value, 4640.6±1.5K is consistent with their medium moving velocity.

Keywords: ultraviolet wavelength region; Geminid meteor spectrum; solar abundance; 3200 Phaethon