

## Color temperature of the Chelyabinsk bolide derived from the Web movie analyses

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We downloaded the movies of the Chelyabinsk bolide, and measured the time variations of the RGB (Red, Green, Blue) video signal values for the asphalt road surface to derived the color temperatures of the bolide. Analytical procedures and the assumptions in the analyses are as follows.

- (1) The road surface scattered only the sky light before the bolide appeared.
- (2) The spectrum of the sky light is due to the Rayleigh scattering of the sunlight.
- (3) The road surface scattered only the bolide radiation after it appeared.
- (4) The gamma value of the camera is 0.45.
- (5) We found a period when the white balance (color balance) of the camera was almost constant.
- (6) RGB video signals correspond the light intensity at the 650, 550, and 450 nm wavelengths.

The derived temperature increases from 7000 K at 3:15:30.0 UT (Feb. 15, 2013) to 9000 K or more at 3:15:30.3 when biggest explosion happened. These values would have an uncertainty of about factor two. The increase of the temperature before the explosion, however, would be real.

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