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# Height measurement from stereo imaging of aurora

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A new stereoscopic measurement technique is developed (Kataoka+2013) to obtain an all-sky altitude map of aurora using two ground-based digital single-lens reflex (DSLR) cameras. Two identical full-color all-sky cameras were set with an 8 km separation across the Chatanika area in Alaska (Poker Flat Research Range and Aurora Borealis Lodge) to find localized emission height with the maximum correlation of the apparent patterns in the localized pixels applying a method of the geographical coordinate transform. It is successfully estimated that a typical ray structure of discrete aurora shows the broad altitude distribution above 100 km, while a typical patchy structure of pulsating aurora shows the narrow altitude distribution of less than 100 km. Recent new findings about the time variation of the emission height and further new challenges of February/March 2014 will also be reported.

Reference: Kataoka, R., Y. Miyoshi, K. Shigematsu, D. Hampton, Y. Mori, T. Kubo, A. Yamashita, M. Tanaka, T. Takahei, T. Nakai, H. Miyahara, and K. Shiokawa (2013), Stereoscopic determination of all-sky altitude map of aurora using two ground-based Nikon DSLR cameras, Ann. Geophys, 31, 1543-1548.

Keywords: aurora, ground-based imaging, digital single-lens reflex camera