Tombaugh 2 : the mean metallicity [Fe/H] = -0.48±0.14 dex ; the reddening E(B-V) = 0.30 ; the distance d = 7.9±0.8kpc ; the galactocentric distance RGC = 14.7kpc ; the distance from the galactic plane z = -0.9kpc, and the age t = 2.0±0.4Gyrs.

The metallicity estimates of these two clusters we obtained in this study are consistant with the relation of the metallicity and the galactocentric distance of old open clusters.

Spectra of Isotopic Molecules in Comets

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Bright comets, such as Hyakutake(C/1996 B2) and Hale-Bopp(C/1995 O1), may provide opportunities to detect weak isotopic lines of ^{18}OH, $C^{34}S$, and CD near strong cometary emission lines of ^{16}OH, $C^{32}S$, and CH. Expected line positions and intencities of the delectronic bands of these isotopic molecules have been calculated using molecular constants available in literature. Detectability of these molecules with various spectral resolutions will be discussed.

On the Temperature Structure of Jupiter's Auroral Thermosphere

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Recent observations of Jupiter's aurora at UV and IR wavelengths have revealed remarkable structures of auroral ovals around both poles. The observed UV emissions consist of H_2 Lyman and Werner band systems excited by auroral particle precipitation, while the most-pronounced IR emissions are from H_3^+ ν_2 fundamental vibration band around 3.5 micron. These emissions are considered to originate from different altitudes, thereby providing complementary information on auroral thermosphere/ionosphere of Jupiter. Especially, temperature information has been successfully sounded from high resolution spectra of both H_2 and H_3^+ emissions. Spectral observations of the auroral H_2 and H_3^+ emissions are briefly reviewed, and an empirical temperature profile of the auroral thermosphere is constructed with inferred temperatures and altitudes from the observations. The temperatures seem to increase rapidly around the methane homopause, resulting in more vertically-extended thermosphere than for non-auroral regions. Cooling rates by hydrocarbon, H_3^+, and H_2 IR emissions are calculated from the empirical temperature profile and are compared with heating rates from auroral electron precipitation and solar UV absorption. It is found that the required heating rates to balance the IR cooling rates are 180 - 200 erg/cm^2/sec, orders of magnitude greater

than the known heating rates near and just above the homopause. It is suggested that a thermospheric wind of 1 km/sec could supply the required heating around 10 microbar via Joule heating.

Blueshift Features Seen in S VI 933 and H I 931 Lines

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We present observational characteristics of blueshift features seen in H I 931 and S VI 933 lines. These lines were taken with spatial resolutions of 1.2″ across the slit and 2″ along the slit. The data cover a quiet region with an area of 100″×100″ located near the disk center. The integration time of 110 seconds was taken to ensure good count statistics. The spatial extent of the blueshift features is found to be about 2″. A total of 5 events was detected with significant blueshifts in 110 seconds which yields a birthrate of the blueshift features of $10^{-21}cm^{-2}s^{-1}$.

Highly broadened S VI 933 lines observed during the event comprise two distinct components, one of which is blueshifted with Doppler shift, ranging from 50 km s^{-1} to 100 km s^{-1} and with line width much larger than the quiet sun average. The redshifted components, however, has Doppler shift and line width, both of which are nearly the same as the quiet sun average.

The H I 931 lines, on the other hand, are found to be easily decomposed into a pair of equally redshifted and blueshifted component, ranging from 10 to 40 km s^{-1} and with line width, nearly identical to the quiet sun average.

These spectroscopic characteristics strongly suggest that the blueshift features may have been driven from the lower transition region and below where H I Lyman lines are formed.

조선왕조실록에 기재된 200년(1392년-1607년) 동안의 혜성 관측 기록

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조선왕조실록에 기재된 태조 원년(1392년)부터 선조 말(1607)까지의 혜성 관측 기록을 조사하였다. 이 기록을 중국고대천상기록총집과 천문 소프트웨어 DANCE에 수록되어있는 혜성 자료와 비