

### [구ID-03] Introduction of High Resolution Spectrograph by using Optical Frequency Comb.

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OFC (Optical Frequency Comb) is an optical spectrum which consists of equidistant lines in frequency space. OFC can thus be used as an optical ruler. Since it was demonstrated in late 1990s, it is revolutionizing many fields in frequency metrology such as the measurement of absolute optical frequencies, the measure ratios of optical frequencies with extremely high precision. It is also used in high-precision spectroscopy. In astronomy, OFC can be used as a very accurate and stable wavelength standard for a high resolution spectrograph to measure the radial velocity of celestial bodies with extremely high accuracy of about several tens cm/s.

In our presentation, we will introduce some basic concepts of OFC and some issues to use it in astronomical spectrograph. We will also present our plan to develop a high resolution spectrograph with OFC.

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### [구ID-04] Focal Reducer for McDonald Otto Struve Telescope

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The CQUEAN (Camera for QUasars in EARly uNiverse) is an optical CCD camera optimized for observation of high redshift objects. It is going to be attached to the cassegrain focus of 2.1m telescope at McDonald Observatory, USA. We are making a focal reducer for CQUEAN to secure a larger field of view.

The focal reducer is composed of four spherical lens, and it reduces the focal length of telescope by one third. We designed the lens configuration, performed tolerance analysis, and estimated the optical performance with ZEMAX. The differences in optical performance with/without filters were also investigated. The result from ZEMAX shows that the system has ample margin of errors for median seeing of 1.2" at McDonald observatory. Even with aberration and alignment tolerance, the performance is better than the original requirement. The lenses are now being made, and the lens barrel and an adapter for assembly of the Andor CCD camera and the filter wheel is now under designing process. We expect that the manufacturing of the focal reducer system as well as its optical test will be finished by April 2010.

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