

CHAIN Project and Flare Monitoring Telescope Installed in Peru

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The Flare Monitoring Telescope (FMT) was constructed in 1992 at Hida Observatory in Japan to investigate the long-term variation of solar activity and explosive events (Kurokawa et al. 1995). It has been part of the international coordinated observations program (STEP) since 1991.

The FMT consists of five solar imaging telescopes and one photoelectric guide-scope. The five telescopes can SIMULTANEOUSLY observe the full-disk Sun without time lag at different wavelengths around H-alpha absorption line or in different modes. Therefore, the FMT can accurately measure the 3-D velocity field of moving structures on the full solar disk.

Making the best use of this feature, Morimoto & Kurokawa (2003) measured 3-D velocity fields of disappearing solar filaments and distinguished whether each filament really erupted or not, and investigated the relationship between filament activities and coronal structures or CMEs. As the result, they found that really erupting filaments almost perfectly corresponded to appearances of coronal arcade structures and CMEs.

On the other hand, Narukage et al. (2002) detected many Moreton-waves (wave-like phenomena seen in the chromosphere, which have been interpreted to be the intersection of a coronal shock waves and the chromosphere) that accompany solar flares by investigating time-evolutions of the Doppler velocity fields around flares, and they also discovered the consistency between Moreton waves and coronal shockwaves observed in soft X-ray.

We want to monitor solar flares and erupting filaments continuously as much as possible by using several of such characteristic telescopes, so that we can investigate correlations between "the velocity and direction of the eruption" and "the strength of effects of the corresponding CMEs on the earth" more concretely. We are then executing "Continuous H-alpha Imaging Network (CHAIN)-project" as part of the IHY/ISWI project and CAWSES/CAWSES-II project (UeNo et al. 2007).

Two groups of the telescopes are candidates for network members. The first group is made up of the existing foreign H-alpha solar full-disk telescopes that will be modified for multi-wavelength observation. The second group is formed by newly installed H-alpha multi-wavelength telescopes. As for the latter group, we are examining the possibility of installing of the telescopes in developing countries. Then, we selected Peru and Algeria as the countries where the 1st and 2nd oversea FMT will be installed (figure 1).

In November 2009, the original FMT at Hida Observatory was dismantled (figure 2) and it was modified for fitting the latitude of Peru. Last January, we sent the FMT to Peru from Kobe port in Japan, and it installed at "Solar Station" of Ica University (see Dr. J. Ishitsuka's newsletter) in March (figure 3).

In the next a few months, some more development of infrastructures and hangar will be continued. After that, regular solar observation will be begun there soon.

Moreover, our observatories are planning to send a staff to Peru and train the method of data analysis to local researchers, and hold an international workshop about solar physics and space weather in this year.

Fig. 1 Map of candidate stations of the CHAIN-project

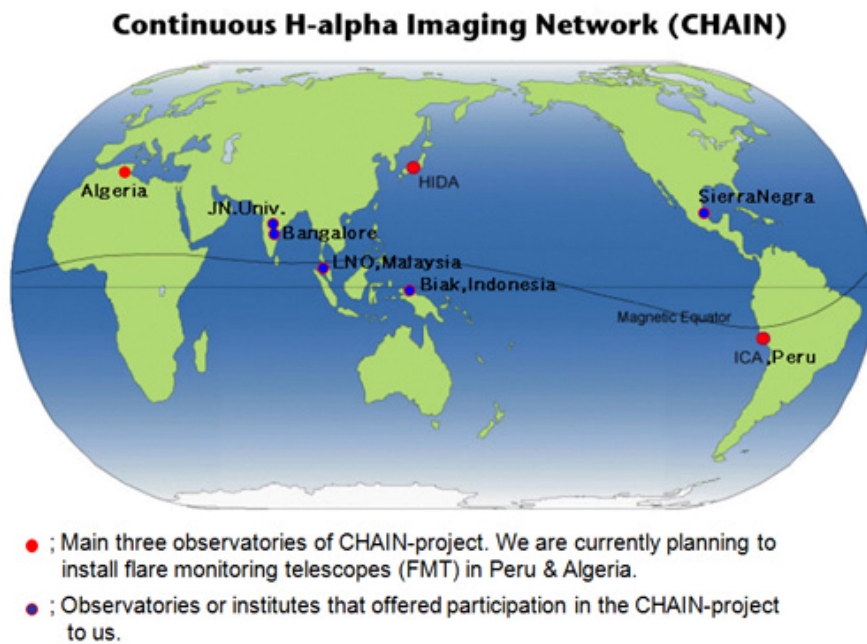


Fig. 2 Dismantlement of the original FMT at Hida Observatory for the preparation of transporting it to Peru on 10th November 2009.



Fig. 3 Installation of the FMT at the Solar Station in Ica University, Peru in March 2010.



References:

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