

**SHARE Everest, the highest (8,000 m a.s.l.) Automatic Weather Station of the world: South Col, Mt. Everest, Nepal.**  
**Technical characteristics and preliminary results.**

Agostino DA POLENZA, Elisa VUILLERMOZ, Gian Pietro VERZA, Alberto CORTINOVIS, Ev-K2-CNR  
Committee, Italy

From more than 20 years, Ev-K2-CNR is promoting scientific and technological research in mountain areas. More recently it has developed the interdisciplinary project SHARE: Stations at High Altitude for Research on the Environment, an environmental monitoring and research activity, comprising a network of observatories included in several international programs like WCRP-GEWEX-CEOP, UNEP-ABC, WMO-GAW, NASA-AERONET.

In this framework SHARE Everest 2008 project has been carried out and on May 15, 2008 the highest Automatic Weather Station (AWS) of the world has been installed at Mt. Everest South Col, (8,000 m a.s.l.).

The idea of the SHARE-Everest 2008 derived from the success of the Ev-K2-CNR Side Event: "Climate Change and Sustainable Development in High Altitude and Remote Areas" during the 15<sup>th</sup> United Nations Commission on Sustainable Development in 2007.

The complex, technologically advanced AWS instrumentation, developed by the Italian manufacturer LSI-Lastem, began collecting data at 15.20, Nepali time, thanks to the exceptional efforts of a skilled team of Italian and Nepali climbers that worked for three hours at 8,000 m without using supplemental oxygen in extreme weather conditions to start the data acquisition process. High quality weather monitoring instruments were customized and adapted for performance at such altitude, in fact the sensors must work in extreme environmental conditions like very low temperature and reduced atmospheric pressure.

The AWS guarantee continuous measurements of air temperature, relative humidity, atmospheric pressure, global solar radiation, UVA radiation, wind speed and direction. The parameters are recorded every ten minutes and data are transmitted hourly to a server at the Pyramid Laboratory-Observatory (5,050 m a.s.l., near Lobuche in Nepal's Khumbu Valley), and from there to Ev-K2-CNR headquarters in Italy.

Measurements from this unique meteorological observatory can provide important information for the scientific community for several application, including weather forecasting and study related to the understanding climate change. This new station, together with the AWS installed in the same period at Kala Patthar (5,600 m a.s.l.) will surely be two significant components of Ev-K2-CNR/SHARE Network in the Khumbu Valley, which already includes AWSs at Lukla: 2,660 (8,727 ft.) m a.s.l., Namche: 3,560 m (11,680 ft.) a.s.l., Pheriche: 4,258 m (13,970 ft.) a.s.l. and at the Pyramid: 5,050 m (16,568 ft.) a.s.l. Near

the Pyramid, at 5,079 m (16,663 ft.) a.s.l., there is also a more complete atmospheric monitoring station which is part of the UNEP Atmospheric Brown Clouds observatory project (reference name: Nepal Climate Observatory- Pyramid) and the WMO Global Atmosphere Watch network (reference name: Pyramid Everest station).

Data from the South Col AWS could contribute to several studies concerning meteorology and climate changes in the region. Information from this station can also help improve safety for Himalayan climbing expeditions, as it is to be integrated in the weather forecast of Nepal's Department of Hydrology and Meteorology Meteorological Forecasting Division.

Ev-K2-CNR researchers have placed special emphasis on potential research activities to be developed in the framework of the WMO Coordinated Energy and water cycle Observation (CEOP) Project and its newly created High Elevations group.

The poster reports a detailed description of the site location, real-time data transmission and functioning of the sensors during the first year of activity. Preliminary data are reported and described further to the quality control based on strange signals on the data for error detection.

Corresponding author:

Name: Elisa Vuillermoz

Organization: Ev-K2-CNR Committee

Address: Via San Bernardino 145, 24126 Bergamo, Italy

Email address: [elisa.vuillermoz@evk2cnr.org](mailto:elisa.vuillermoz@evk2cnr.org)