Detection of "El Niño" Effect at the Roque de los Muchachos Observatory?

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El Niño happens when tropical Pacific Ocean trade winds die out and ocean temperatures become unusually warm. There is a flip side to El Niño called La Niña, which occurs when the trade winds blow unusually hard and the sea temperature become colder than normal. El Niño and La Niña are the warm and cold phases of an oscillation referred to as El Niño/Southern Oscillation, or ENSO. Although ENSO originates in the tropical Pacific ocean-atmosphere system, it has effects on patterns of weather variability all over the world. It is believed, for instance, that El Niño conditions suppress the development of tropical storms and hurricanes in the Atlantic, and that La Niña favors hurricane formation.

The index used to monitor the coupled oceanic-atmospheric character of ENSO is called the Multivariate ENSO Index (MEI) based on the main observed variables over the tropical Pacific. The MEI can be understood as a weighted average of the main ENSO features contained in the following six variables: sea-level pressure, the east-west and north-south components of the surface wind, sea surface temperature, surface air temperature, and total amount of cloudiness. Positive values of the MEI represent the warm ENSO phase (El Niño).

On the William Herschel Telescope weather observing downtime is recorded by observers when the following happens: humidity is higher than 90%, mirror temperature is less than 2 degrees of the dew point, wind speed is higher than 80 km/h (or gusts for more than 10 seconds are above 80 km/h), dust is clearly visible in the beam of a torch, or if the dome shows any resistance to movement due to the presence of ice.

In spite of the inaccuracies present in the process of recording weather downtime, and the fact that several elements contribute to the downtime apart from rain, it is possible to see some teleconnection between the MEI index and the percentage of weather downtime as it is shown in the accompanying plots. A study of rainfall and MEI carried out at Teide Observatory on Tenerife (Sergio Suárez Izquierdo, 2003, "Relaciones observadas entre el fenómeno de "El Niño" y las precipitaciones en la isla de Tenerife", I Encuentro sobre Meteorología y Atmósfera de Canarias, DG-INM, November 2003, p. 51.) came to a similar conclusion. ¤

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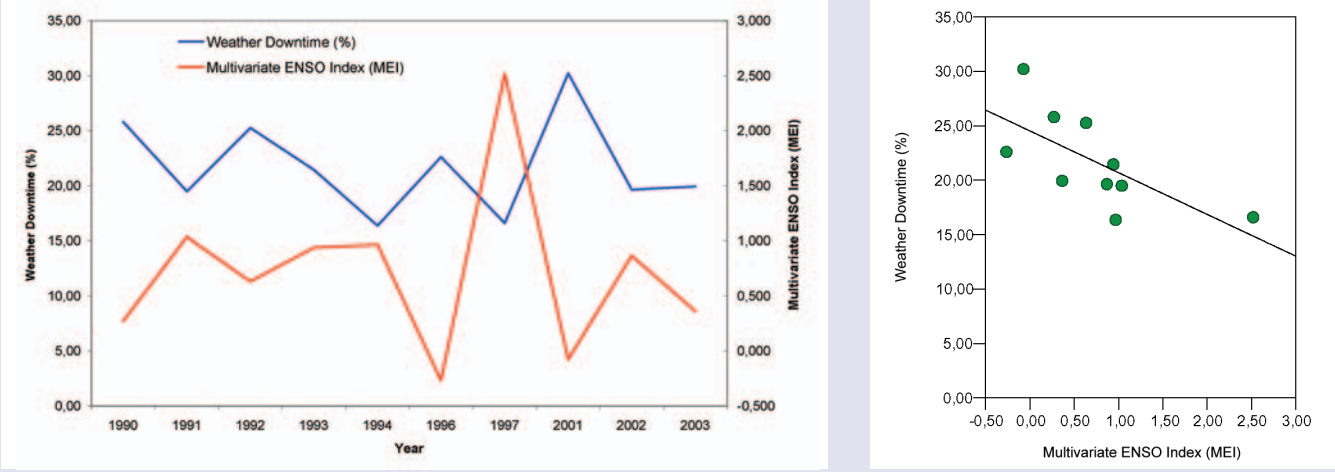

Left: Comparison between the percentage of weather observing downtime at the William Herschel Telescope and the Multivariate ENSO Index (MEI) averaged from June to December inclusive (when the highest correlation is found). Only the episodes with averaged MEI positive in the period June-May are considered, ie. when the El Niño effect took place in the interannual period June-May then we averaged weather downtime and MEI index for the corresponding period June-December. Right: Same data as before. Correlation of linear regresion is r = −68 or confidence level of 95%.

New Additions to the ING Collection of Messier Objects

M83 Galaxy. Color images of this galaxy reveal a wide range of colors from the yellow central core of old stars to the blue spiral arms of young stars. Several red knots can also be seen These are gaseous nebulae where active star formation is taking place. Dark lanes of dust are also visible throughout the galaxy's disk. The image shown on the next page was obtained in February 2004 using the Prime Focus Camera on the William Herschel Telescope, and it is a combination of filters Johnson B, V and R. Credit: Chris Benn (ING) and Nik Szymanek (University of Hertfordshire).

M81 Galaxy. The image is a combination of exposures obtained in 2003 from Wide Field Camera on the Isaac Newton Telescope (courtesy of Jonathan Irwin) and Digitized Sky Survey 2 images. Credit: ESA/INT/DSS2.

M74 Galaxy. Its arms are traced with clusters of blue young stars and pinkish colored diffuse gaseous nebulae (HII regions), and reach out to cover a region of roughly 95,000 light years, or about the same size as our Milky Way galaxy. The image was obtained in August 2004 using the Wide Field Camera on the Isaac Newton Telescope. The colour composite was built from filters B, V and R and using Adobe Photoshop with the help of the ESA/ESO/NASA Photoshop FITS Liberator plugin. Credit: Simon Dye (Cardiff University).