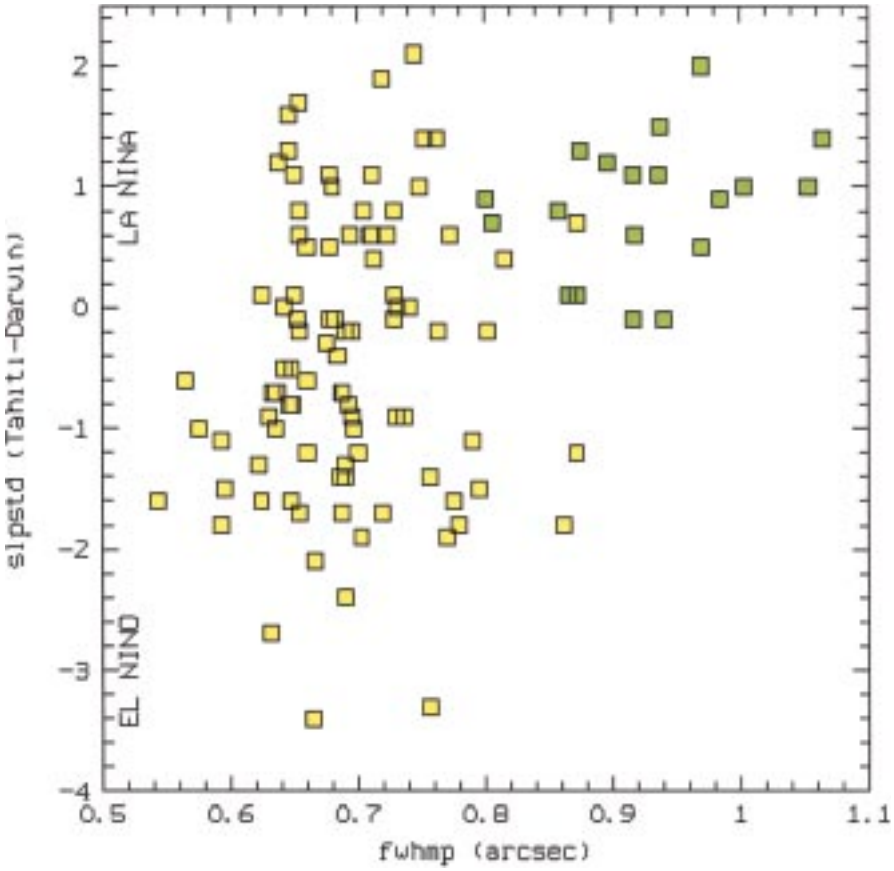

Figure 2: Correlation of the standardised monthly Southern Oscillation Index (SOI) with monthly average seeing at Paranal during 1988–1997 (yellow) and since April 1998 (green). The SOI represents the sea level pressure anomaly between Darwin and Tahiti (http://www.cpc.noaa.gov/data/indices/). A negative index corresponds to warmer waters (El Niño), a positive index to cooler ones (La Niña).

Six months later, and in spite of much wishful thinking, the site quality has only marginally improved and remains way below the standards established during the extensive site survey (dashed lines, Fig. 1). This means for the observatory that Period 64 should not be better than Period 63 which provided sub-half arcsecond seeing only 13% of the time (R. Gilmozzi, *The Messenger* 98, December 99, to be compared 21% in the period 1989–1995). During that same period, La Silla, which is not undergoing any visible climate change but is rather on a favourable phase of its own cycles, had been producing 8% of such good-quality observing time and promises even more in Period 64.

It was reported (*The Messenger* 90, December 1997) that cloudiness at Paranal was obviously increasing with warmer sea water, i.e., El Niño events. The dependency of Paranal seeing to El Niño cycles had been indeed similarly tested over a decade in the past (1988–1997) but without unveiling any correlation (yellow squares in Fig. 2). It was thus concluded that the basic Paranal observing conditions were weather independent. The seeing increase of the past 20 months (green squares in Fig. 2 corresponding to the period shown in Fig. 1) is mainly due to a particular North-East wind pattern which lasts part of the night, a few times per month. As shown in Figure 2, all these poor months belong to the current La Niña and the seeing trend even shows some correlation with the standardised Southern Oscillation Index (SOI) which is commonly used to define the state of the Pacific Ocean surface temperature.

The El Niño and La Niña cycles are hardly predictable and many past attempts failed. Some success was apparently obtained by a model based on solar-activity cycles which correctly predicted the 1997–1998 El Niño event (http://www.microtech.com.au/daly/sun-enso/sun-enso.htm). If one can believe such models, the next El Niño event should arrive in 2002, perhaps bringing to an end the current phase of poorer than average astroclimate on Paranal.

Moreover, recent analyses of sea surface elevation measured by the Topex-Poseidon satellite (NASA/JPL News release, Jan. 20, 2000) lead researchers to suspect the Niño-Niña oscillations to sit on, and therefore partially hide, a much wider (20–30 years period) so-called Pacific decadal oscillation. If this phenomenon was confirmed and quantified, it would provide new perspectives to astroclimatological surveys; let us thus wait and see.

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ESO Demonstration Project with the NRAO 12-m Antenna

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During the months of September through November 1999, an ALMA joint demonstration project between the European Southern Observatory (ESO) and the National Radio Astronomy Observatory (NRAO) was carried out in Socorro/New Mexico. During this period, Robert Karban (ESO) and Ron Heald (NRAO) worked together on the ESO Demonstration Project. The project integrated ESO software and existing NRAO software (a prototype for the future ALMA control software) to control the motion of the Kitt Peak 12-m antenna. ESO software from the VLT provided the operator interface and coordinate transformation software, while Pat Wallace's TPOINT provided the pointing-model software.

On the 26 to 28 November, the project had its highlight – the final test with the Kitt Peak 12-m antenna at the NRAO Observatory in Tucson/Arizona. Since the test period lasted only 72 hours, it was essential to prepare, plan and test the software thoroughly and systematically. To accomplish this, practices of ESO Software Engineering were applied. ESO configuration management, systematic regression testing, build procedures, development environment, test preparation and documentation procedures were used. Using these methods enabled us to manage efforts among the various persons in the project locally, as well as to provide remote support from ESO. The project was successfully completed. For the test results and more details on the project, see
http://www.alma.nrao.edu/development/computing/news/index.html

We would like to thank Bob Freund and the other members of the Tucson operations staff who provided us excellent system support during these three days at the 12-m.