100^{th} Issue Special Report (M. Sarazin, January 16, 1997)

The first Trimestrial Meteorological Report was issued exactly 12 years ago in Spring 1984. At that time one year of data on cloud and water vapor were already pointing towards Paranal as an outstanding place. This tendency was confirmed over the years and the basis of the 1990 Council decision to build the VLT on Paranal still holds as the project reaches completion.

However, as this 100^{th} Issue curiously points out, there have been ups and downs on both sites. For instance, Spring 1996 was one of the best of the past 12 years at La Silla, and particularly disappointing at Paranal: the result is that La Silla looks as good as Paranal considering the past three months. This is yet another confirmation that sites for large projects can be efficiently chosen only after several years of surveys.

How long should a site survey last? The minimum time is obviously one year to cover seasonal effects. A parameter such as cloud cover seems to have 5 to 11-year cycles (see Figure 1) but the characteristics of 70 additional photometric nights per year at Paranal were already reached in 1990, ie. after only 6 years of monitoring. On the other hand, as shown on Figure 2 shorter periods such as 1988-1990 would have induced up to 50% error in the estimate.

As far as seeing is concerned, no long-term periodicity appears but La Silla endured a long period between 1992 and 1993 (see Figure 3) without a single opportunity of sub-half arcsecond seeing. Conversely, La Silla/Vizcachas approached Paranal quality on several occasions such as March and December 1989 (NTT commissioning), April 1990, January 1994 and very recently in November 1996. Paranal is much more stable, providing more than 15% of sub-half arcsecond seeing over the years, reaching 40% in May-June 1994.

The constitution of a long-term database of astroclimatological parameters allows ESO to currently develop statistical algorithms and test physical models for the short and medium range forecast of the observing conditions at the VLT observatory.

Acknowledgements: since the number of protagonists behind the statistics is overwhelmingly large, a good solution in such cases is just to pick out one. Because he was already on duty at Paranal as early as 1983 and is still serving as site monitoring operator, *Francisco Gomez Compiano* deserves particular mention for his perseverance and rigorous work which contributed to maintaining the quality of the data throughout these 100 issues.

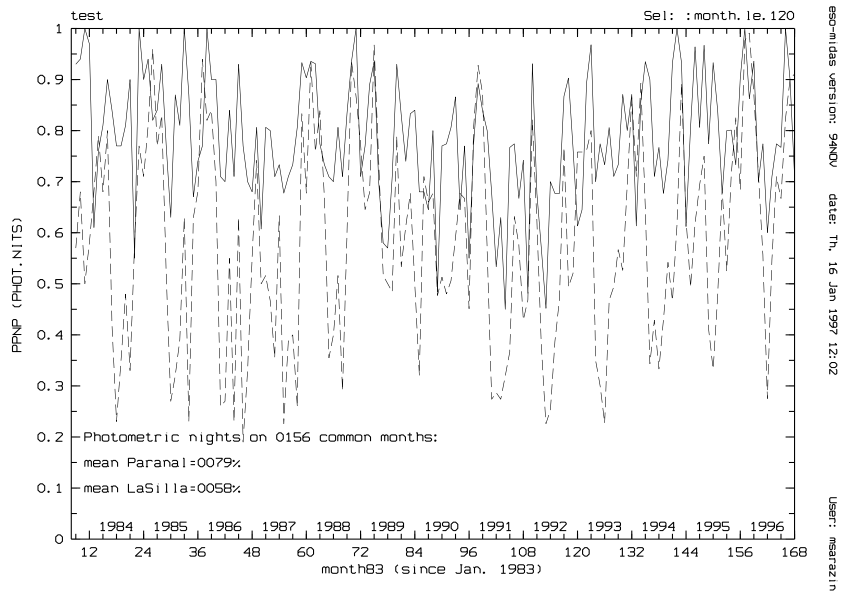

Figure 1: Thirten Years Comparison of Monthly Percentile of Photometric Nights

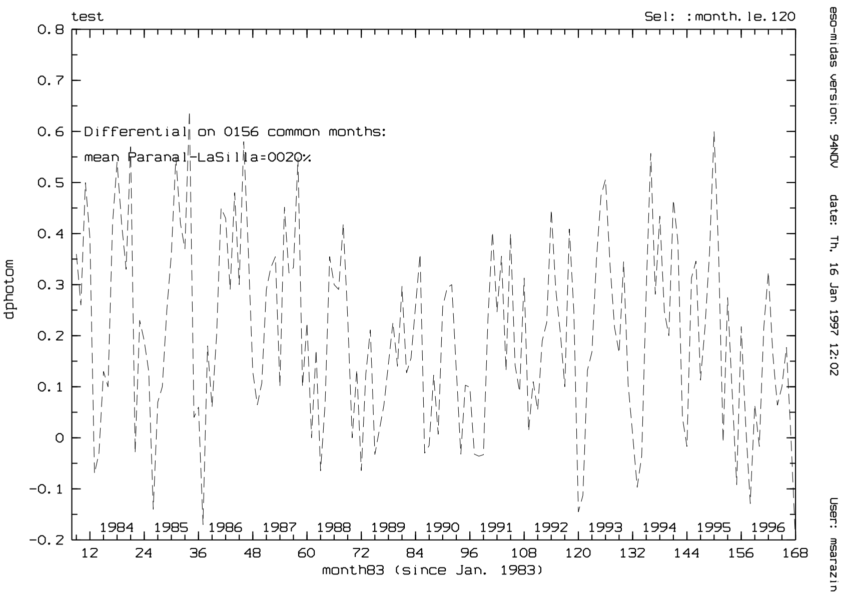

Figure 2: Monthly Percentile of Photometric Nights Differential between Paranal and La Silla

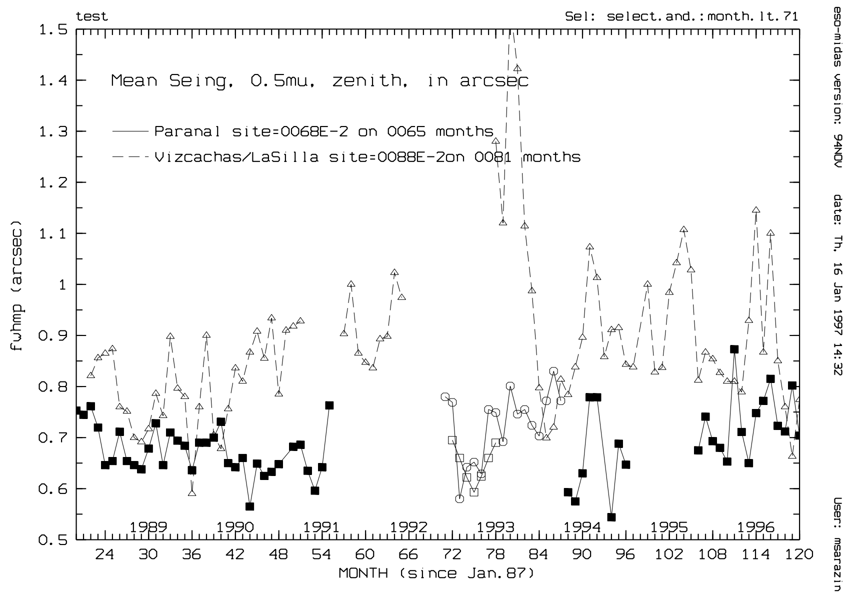

Figure 3: Monthly Median Seeing at ESO sites at 5 m above ground. Measurements were disrupted in 1992 at Vizcachas (7 km East of La Silla, on the same ridge) after the instrument was destroyed by lightning; they resumed in 1993 from La Silla. Measurements were disrupted in 1991 at Paranal when leveling work started; they resumed 16 months later tentatively 1 m above ground until April 1994 when a 5 m tower was available.