observing conditions only. It can be seen that in general over the indicated period of time atmospheric transmission at 230 GHz was quite good, roughly between 80 % and 90 %, as can be seen more clearly from Fig. 4, which shows the distribution of zenith transmissions. The lowest transmission obtained from individual skydips are 46 % and 57 %. Translated into more usable terms this means that the amount of water vapour usually varied between 3.3 mm and 1.6 mm. On a whole, transmission was best in July and August which is possibly due to the season, winter bringing along less humidity.

To conclude, La Silla appears to be a good site for mm-wave observations, with 230 GHz transmissions very often between 80 % and 90 % (3.3 mm to 1.6 mm H_2O). We have noted, however, that the observed atmospheric temperature profile depends on the azimuth of the observations. Practically all temperatures measured in a SW direction increase with increasing secz. As a contrast, in the east the temperature profile in many cases deviates systematically from what we expect in that it is partly inverted. This difference may be due to the fact that in the east one is looking towards the Andes mountain range while in the SW the topology of the land is different, which may cause a difference in H_2O concentration. This interpretation is somewhat complicated by the fact that the CAT features a Nasmyth mirror, which has a slightly different vignetting at different azimuths, possibly causing the efficiency factor to differ accordingly. We are not able to estimate the influence of this effect on the basis of presently available material.

Acknowledgement

We are very much indebted to the people of the technical staff at La Silla, who were always willing to give their support when problems arose.

Reference

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A New System to Eliminate Gear Backlash in Telescopes

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Preloading a telescope geardrive, to eliminate backlash, always has been a major design aspect in telescope engineering. One of the oldest systems was to preload each axis with a steel cable, wrapped around the axis and loaded with a sufficient heavy weight, to keep the mating flanks of the gearwheel in contact under all circumstances, e.g. during windforces, unbalance, etc.

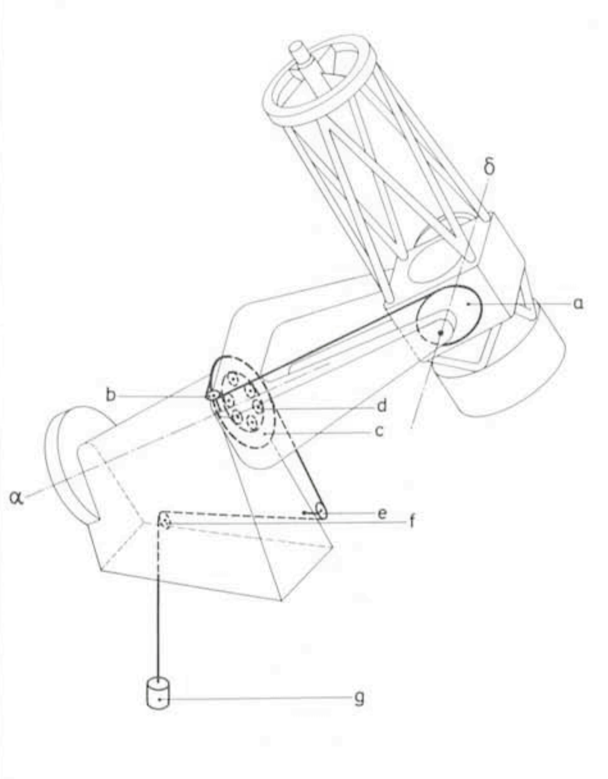
This system is still in use. To preload the polar axis is quite simple, but for the declination axis, it requires a number of rollers to guide the cable inside the polar axis. In several cases this gives problems, due to the necessary cabling, oilducts, etc., that have to pass also.

Therefore, other systems have been applied, e.g. splitgears, double-gear systems, etc. The disadvantage is the extra friction that results. Preloading the gears by two counteracting motors on each of the axes is often applied today. It is however a rather expensive solution. Besides these systems, there are more. It is not the place here to go into all of them in detail.

Mr. Vanhauwaert, of the Astro Workshop at La Silla, got an interesting idea to preload both telescope axes with one weight, that moreover avoids passing of the cable inside the polar axis. This idea is illustrated by the sketch and functions as follows:

The cable disk A is rigidly attached to the telescope tube. The cable end is fixed to this disk. The cable, loaded by weight G, is guided by cable roller B, and passes the big ring-shaped disk C. Further it is guided by the rollers E and F. The main features of this system are the roller B, that is fixed on the fork, and the ring-shaped disk C that can rotate freely about the polar axis over the rollers D. The preload moment about the polar axis results from the cable force at roller B multiplied by the distance between this force and the polar axis centre.

This system has been realized on one of the telescopes at La Silla about half a year ago, and proved to function very well.



The "Vanhauwaert" preload system with one weight