from A04):

$$\theta_0 = \left[0.423 \left(\frac{2\pi}{\lambda}\right)^2 \int \mathrm{d}h\, h^{5/3} C_\mathrm{N}^2(h)\right]^{-3/5}, \quad (1)$$

where λ is the wavelength. Therefore, the correction of the C_N^2 profiles can have a strong impact on the values of θ_0. From each corrected $C_\mathrm{N}^2(h)$ one corrected value of the isoplanatic angle is obtained. The cumulative distribution of the corrected θ_0 is shown in Figure 5. The median value increased by the modest amount of 4.8% with respect to the median value of θ_0 obtained with the uncorrected turbulence profiles. However, under certain observation parameters and turbulence conditions, the isoplanatic angle increased significantly after the C_N^2 correction: in 10% of the cases, the increase was higher than 25%, and reached 40% in a few cases.

5. CONCLUSIONS

Although the impact on individual estimates of turbulence profiles caused by the correction of the normalization error may be very strong depending on the observational parameters – as deduced for example from the bottom right plot in Figure 1, the statistical parameters that describe the optical turbulence profiles measured at the OAN-SPM vary by a relatively small amounts after the correction. The vertical distribution of the median C_N^2 (on a logarithmic scale) remains basically the same as before the correction, the values being only multiplied by an average factor of 0.87. After correction, the median whole-atmosphere and free-atmosphere seeing diminished by 4.2% and 10.2% respectively, the correct values being 0.68 and 0.35 arc seconds. The altitude slab where the correction has the strongest impact is from 2 to 4 km, with a decrease in median seeing of 15.8% and 13.6% for measurements at SPM1.5 and SPM2.1. The corrected median value of the isoplanatic angle is $1\farcs96$ which represents an increase of 4.8% relative to the uncorrected value.

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