

canonical coordinates, to extend the constants of integration to the field of analytic functions.

We can also obtain the changes of the disturbed orbit by computing the variations of the keplerian elements. The variations of the eulerian angles  $\Omega$ ,  $\omega$  and  $I$  are obtained by solving a system of Riccati's equations in the complex domain (sphere of unitary radius as reference). The values of the variations  $\delta a$ ,  $\delta e$ ,  $\delta \varepsilon$  and  $\delta T$  are obtained from the developed forms of the dot products:

$$\bar{f} \cdot \bar{\varepsilon} = 0, \quad \bar{\varepsilon} \cdot \bar{a} = 0, \quad \bar{a} \cdot \bar{f} = 0.$$

We have here (instantaneous orbital plane):

$\bar{f}$ : Lagrange's (perihelic) vector.

$\bar{a}$ : A coplanar vector,  $90^\circ$  ahead.

$\bar{\varepsilon}$ : The instantaneous angular momentum vector.  
And by considering the relationship:

$$-nT = \varepsilon - \omega$$

the Lagrange operator  $\delta$  implies that  $\delta t = 0$  (implicit differentiation with respect to time) which is consistent with the definition of the disturbed mean longitude

$$l = \int n \, dt + \varepsilon.$$

#### THE IMPORTANCE OF THE CHILEAN MERIDIAN OBSERVATIONS IN THE FK5 CATALOGUE

C. Anguita, G. Carrasco, and P. Loyola

Depto. de Astronomía, Universidad de Chile  
and

A. Nemiro, D. Polojentsev, V. Shishkina, and M. Zverev  
Pulkovo Observatory, Russia

For the compilation of the southern part of the FK5 Catalogue, 18 meridian catalogues were used, which were obtained at the southern hemisphere observatories of Melbourne (2 catalogues), La Plata (2 catalogues), Santiago (7 catalogues), Leoncito (1 catalogue), Perth (2 catalogues) and San Juan (3 catalogues).

At the National Astronomical Observatory, Santiago, Chile, with participation of Pulkovo astronomers, the following catalogues were obtained:

Catalogue	Meth. <sup>a</sup>	Decl. Zone		Mean Epoch
	Number FK4 Stars	Mean Number Obser.	Mean Error <sup>b</sup> $\alpha$	$\delta$
1 SPF3A	S 671	+40° 5	-90° 5	1964 ...
2 SPF1A	S 1044	+41 6	-90 8	1965 ...
3 SPF1DCORR	S 505	+40 8	-90 ...	1965 18
4 SPF2	S 1043	-47 15	-90 4	1965 10
5 SANTCH65/-65	D 505	-47 18	-90 ...	1965 10
6 SANTCH67	D 386	-25 5	-47 6	1967 12
7 SANTCH71A (SPu 71)	A 1960	+40 32	-90 3	1971 ...

<sup>a</sup> S: semi-absolute, D: differential, A: absolute.

<sup>b</sup> In units of  $\pm 0.001$ s for  $\alpha$  and  $\pm 0.01''$  for  $\delta$ .

The basic material for the system of the FK5 Catalogue, south of  $-40^\circ$  declination, consists of 56% of chilean catalogues, and 39% for the FK5 stellar positions. It is important to mention that the Catalogue SANTCH71A(7) is one of the few southern hemisphere catalogues which has ever been observed and compiled strictly using the absolute method.

This shows the relevance the chilean meridian catalogues had in the construction of the Fifth Fundamental Catalogue.

#### A HARD WAY TO PRECISION. 30-YEAR LONG STORY OF THE EXPERIENCE WITH THE ZVEREV PHOTOGRAPHIC VERTICAL CIRCLE

B.K. Baguidinsky, G.A. Goncharov, E.V. Kornilov,  
V.A. Naumov, D.D. Polojentsev, S.P. Puliaev,  
V.D. Shkutov, and E.G. Zhilinsky  
Pulkovo Observatory, Russia

and

C. Torres

Observatorio Astronómico Nacional, Chile

The Pulkovo Photographic Vertical Circle (PVC) was built under M.S. Zverev's direction in the early sixties and engaged in absolute observations of declinations. Two PVC catalogues were obtained: the absolute catalogue —compiled on the basis of observations of 1420 FK4 and FKSZ stars in