$$\text{Synodic radial Compt. at limb} = v.\frac{R}{r}$$

$$\text{Sidereal} \quad " \quad " \quad " = v.\frac{R}{r} + s$$

$$\text{Sidereal velocity of rotation } V = \frac{\xi}{\xi'}\left(v.\frac{R}{r} + s\right)\sec\eta$$

Where ξ and ξ'— are the angular velocities at the limb and at the mean latitude † of the observed points φ_1 and φ_2 obtained from the second method

$$\xi \text{ (Adams)} = 11°.04 + 3°.5\cos^2\varphi.$$

12. Second Method—Corrections at observed points.

(*a*) Determine the heliographic latitudes φ_1 and φ_2 of the observed points by the Greenwich method

$$\sin\varphi = \cos\rho\sin D + \sin\rho\cos D\cos\chi$$

$$\left(\sin\rho \text{ and } \cos\rho \text{ obtained from De LaRue's tables argument } \frac{R}{r}\right)$$

also the differences of longitude λ_1 and λ_2

$$\sin\lambda = \sin\chi\sin\rho\sec\varphi.$$

(*b*) Determine the angles η_1, η_2 at the two observed points

$$\cos\eta = \cos D\cos\left(\frac{\pi}{2} - \lambda\right)$$

(*c*) Divide the total sidereal radial velocity into the two following parts proportional to the angular velocities at the latitudes φ_1, φ_2 (obtained closely enough from Adams' formula $\xi = 11°.04 + 3°.5\cos^2\varphi$)

$$2\left(v + \frac{r}{R}s\right)\frac{\xi_1}{\xi_1 + \xi_2} \quad , \quad 2\left(v + \frac{r}{R}s\right)\frac{\xi_2}{\xi_1 + \xi_2}$$

(*d*) Sidereal Velocities of Rotation:—

$$V_1 = 2\left(v + \frac{r}{R}s\right)\frac{\xi_1}{\xi_1 + \xi_2}\sec\eta_1$$

$$V_2 = 2\left(v + \frac{r}{R}s\right)\frac{\xi_2}{\xi_1 + \xi_2}\sec\eta_2$$

For *c* and *d* may preferably be substituted the following practically identical but simpler method.

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† Instead of taking the mean latitude $\frac{\varphi_1 + \varphi_2}{2}$ it is more correct to take the angle φ^1 such that $11°.04 + 3.5\cos^2\varphi^1 = \frac{1}{2}(11°.04 + 3.5\cos^2\varphi_1 + 11°.04 + 3.5\cos^2\varphi_2)$. This was not necessary in Series I and III but in Series II this difference in one case reaches 23′ which changes the correction slightly.