A corollary of the theorem of recurrence

From recurrence theorem of the Frenet formulas, we know that

$$\omega_{k+1} = \sqrt{\dot{\theta}_k{}^2 + \omega_k{}^2}\,.$$

Then we have also

$$\omega_k = \sqrt{\dot{\theta}_{k-1}{}^2 + \omega_{k-1}{}^2}\,.$$

So, then we can write

$$\omega_{k+1} = \sqrt{\dot{\theta}_k{}^2 + \dot{\theta}_{k-1}{}^2 + \omega_{k-1}{}^2}\,.$$

Finally, we can get that

$$\omega_{k+1} = \sqrt{\dot{\theta}_k{}^2 + \dot{\theta}_{k-1}{}^2 + \ldots\dot{\theta}_1{}^2 + \omega_1{}^2}.$$

This would mean that, if the last term under the radical expansion, namely $\omega_1{}^2$, would be zero, then we could conclude that the darbuzian of any order (represented here by ω_{k+1}) depends only on variations of the lancretians of lower order.

As a consequence, we also have the remarkable property:

$$|\omega_{k+1}| \geq |\omega_k| .$$

Un corolar al teoremei de recurență

Din teorema de recurență a formulelor lui Frenet, ştim că

$$\omega_{k+1} = \sqrt{\dot{\theta}_k^{\,2} + \omega_k^2} .$$

Atunci avem şi

$$\omega_k = \sqrt{\dot{\theta}_{k-1}^{\,2} + \omega_{k-1}^2} .$$

Deci, putem scrie atunci

$$\omega_{k+1} = \sqrt{\dot{\theta}_k^{\,2} + \dot{\theta}_{k-1}^{\,2} + \omega_{k-1}^2} .$$

În final, putem obține că

$$\omega_{k+1} = \sqrt{\dot{\theta}_k^{\,2} + \dot{\theta}_{k-1}^{\,2} + ...\dot{\theta}_1^{\,2} + \omega_1^2}.$$

Asta ar însemna că, dacă ultimul termen al dezvoltării de sub radical, adică ω_1^2, ar fi nul, atunci am putea ajunge la concluzia că darbuzianul de orice ordin (reprezentat aici prin ω_{k+1}) depinde doar de variațiile lancretienilor de ordin inferior.

În consecință, mai avem şi proprietatea remarcabilă:

$$\left|\omega_{k+1}\right| \geq \left|\omega_{k}\right|.$$