OPTIMIZING THE ASSEMBLING OF RADIAL SPHERICAL PLAIN BEARING APPLIED TO RSRC MECHANISM

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Abstract: The paper presents a methodology for optimizing the assembling of a spherical bearing. The condition of optimising is that the ruled surface generated by the axis of the inner ring should be placed in a revolution cone co-axial with the outer ring. The apex angle of the revolution cone is *a priori* précised. The procedure is applied to the RSRC mechanism. Finally, for a actual geometrical data of the mechanism, numerical results are presented.

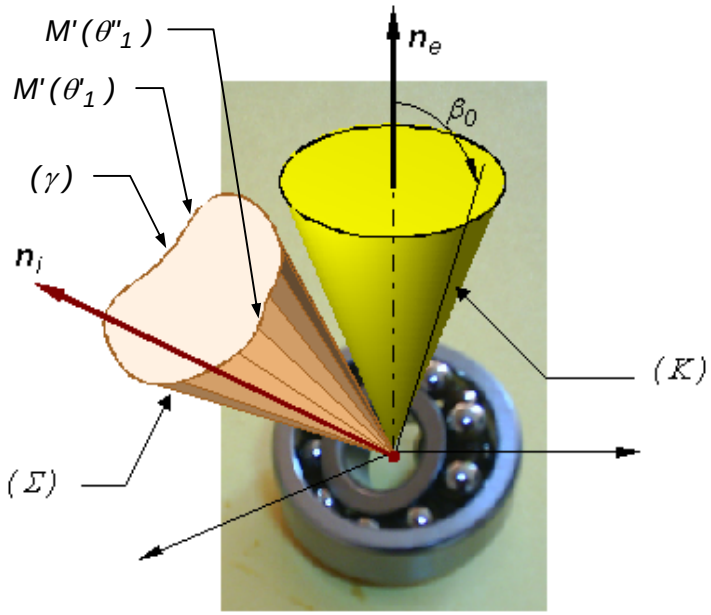

Fig 7. The conical surface and manufactured limit cone

The ruled surfaces (Σ), generated by the axis of the floating element, in the crank frame, is given by parametric equations:

$$\begin{cases} x_2(\theta_1,t)=(L-t)\cos\zeta(\theta_1)\cos\eta(\theta_1) \\ y_2(\theta_1,t)=(L-t)\sin\zeta(\theta_1)\cos\eta(\theta_1) \\ z_2(\theta_1,t)=(L-t)\sin\eta(\theta_1) \end{cases},$$

The optimising condition is:

$$d\left(\frac{\overline{O_2M(\theta'_1)}\cdot\overline{O_2M(\theta''_1)}}{\left|\overline{O_2M(\theta'_1)}\right|\overline{O_2M(\theta''_1)}}\right)=0$$

with the restriction:

$$\theta'-\theta''\neq 2k\pi, k\in \boldsymbol{Z}$$

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