

## INTEGRAL INVARIANTS OF THE TRAJECTORY SURFACES

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The geometry of path trajectory ruled surfaces generated by the oriented lines fixed in a moving rigid body is important in the study of rational design problem of spatial mechanism. An x-closed trajectory ruled surface (x-c.t.s.) is characterized by two real integral invariants, the pitch  $l_x$  and the angle of pitch  $\lambda_x$ . Using the integral invariants, the closed trajectory surfaces have been studied in many papers [1],[2].

In this study, based on [3] introducing a relationship between the dual integral invariant  $\Lambda_x$ , and the dual area vector,  $V_x$ , of the spherical image of an x-c.t.s., new results on the feature of the trajectory surfaces are investigated. And also, since the dual angle of pitch, defined in [4], of an x-c.t.s. is a useful apparatus in the study of line geometry, we use the dual representations of the trajectory surfaces with their dual angle of pitches.

Therefore, besides the results on the real angle of pitches, that some of them given [3] many other results on the pitches of closed trajectory ruled surfaces are obtained. And some relationships between the other invariants are given. Also, using the same method, the area of projections of spherical closed images of the trajectory surfaces are studied.

It is hoped that the findings will contribute to the geometry of trajectory surfaces, so the rational design of spatial mechanisms.

## References

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