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SOME RESULTS ON FRENET RULED SURFACES ALONG THE EVOLUTE-INVOLUTE CURVES, BASED ON NORMAL VECTOR FIELDS IN E^3

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Abstract. In this paper we consider eight special Frenet ruled surfaces along to the involute-evolute curves, α^* and α respectively, with curvature $k_1 \neq 0$. First we find the excplit equation of Frenet ruled surfaces along the involute curves in terms of the Frenet apparatus of evolute curve α. Also normal vector fields of these Frenet ruled surfaces have been calculated too.

Further we give all results for sixteen positions of Normal vector fields of four Frenet ruled surfaces in terms of Frenet apparatus of evolute curve α. These results also give us the positions of eight special Frenet ruled surfaces along to the involute-evolute curves, based on their normal vectors, in terms of curvatures of evolute curve α. We can give the answer of the questions that in which condition we can produce orthogonal surfaces or surfaces with constant angle. For example Darboux ruled surface and *involutive tangent ruled surface* of an evolute α have the perpendicular normal vector fields.

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1. Introduction and Preliminaries

Deriving curves based on the other curves is a subject in geometry. Involute-evolute curves, Bertrand curves are this kind of curves. By using the similiar method we produce a new ruled surface based on the other ruled surface. The Involutive B *scrolls* are defined in [11]. $\tilde{D}$ *scroll*, which is known as the rectifying developable surface, of any curve α and the *involute* $\tilde{D}$ *scroll* of the curve α are already defined, in Euclidean three-space. Also the differential geometric elements of the *involute* $\tilde{D}$ scroll are examined in [16]. In this paper we consider the following four special ruled surfaces associated to a space curve α with $k_1 \neq 0$. They are