

# On Characterization of Time-Like Horizontal Biharmonic Curves in the Lorentzian Heisenberg Group $Heis^3$

Essin Turhan and Talat Körpınar

Fırat University, Department of Mathematics, 23119, Elazıg, Turkey

Reprint requests to E. T.; E-mail: [essin.turhan@gmail.com](mailto:essin.turhan@gmail.com)

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In this paper, we study energy of time-like horizontal biharmonic curves in the Lorentzian Heisenberg group  $Heis^3$ . We characterize the biharmonic curves in terms of their curvature and torsion. We prove that all of the biharmonic curves are helices. Finally, we study the mechanics of biharmonic curves and provide conditions for energy of horizontal biharmonic curves.

*Key words:* Heisenberg Group; Biharmonic Curve; Helices; Horizontal Curve.

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