Dedications

This research is dedicated with love and affection

To my parents,

Brothers and my Sister

Acknowledgments

I thank the God for his unprecedented love and grace upon me and gave me resolve to finish this work. I am grateful to several people for helping, in one way or other, I would like to express my sincere gratitude to the Sudan University of Science & Technology (SUST) and my teachers in the department of mathematics science, realizing that those whom I owe the most I cannot thank enough, and that the things for which I am most grateful, I cannot put into words. I am indebted to so many sources that it is hardly possible to acknowledge them all.

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Abstract

This researh discuss applicotions on differentail forms on vector calculuse and Hamiltonian mechanics which introduce how to employ Geometric Calculus in the formulation of Hamiltonian mechanics, though space limitations preclude the discussion of applications or advanced theory. However, the fundamentals are discussed in sufficient detail with supplementary references to make translation of standard results in symplectic geometry and Hamiltonian mechanics into the language of Geometric Calculus fairly straightforward.

الخلاصة

فى هذا البحث ناقش الباحث تطبيقات الصيغ التفاضلية لحسبان المتجهات و ميكانيكا هاميلتونيان، و علاقة الصيغ التفاضلية مع حسبان المتجهات و ناقشنا كيفية توظيف الحسبان الهندسى فى صياغة ميكانيكا هاميلتون ، على الرغم من أن ضيق المكان يحول دون مناقشة أو تطبيقات نظرية متقدمة. ومع ذلك تمت مناقشة الأساسيات بتفصيل كاف مع المراجع التكميلية لجعل الترجمة من النتائج القياسية في الهندسة و ميكانيكا هاميلتونايان في لغة الحساب الهندسي واضحة إلى حد ما.