

- Document Type** : Thesis
- Document Title** : *Geometry of tangent bundles of some almost hermitian manifolds*
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- Document Language** : Arabic
- Abstract** : Geometry of tangent bundle $T M$ of a Riemannian manifold (M, g) with the metric f_j defined by Sasaki [25] has been extensively studied since the 60s. Explicit expressions for the Lie bracket of the tangent bundle $T M$ was given by Dombrowski [10]. The Levi-Civita connection of the Sasaki metric on $T M$ and its Riemannian curvature tensor were calculated by Kowalski [14]. Another metric nicely fitted to the tangent bundle is the so-called Cheeger-Gromoll metric [8]. It was expressed more explicitly by Mussu and Tricerri [20]. Sekizawa [26] calculated the Levi-Civita connection and the curvature tensor of the tangent bundle equipped with Cheeger-Gromoll metric. The geometry of totally geodesic submanifold of the tangent bundle was studied by Abbassi and Yambolsky [3]. Very recently, Marian [19] has introduced a metric called the general metric which generalizes the above mentioned metrics. The aim of this thesis is to give a detailed presentation of some of the most important results in the field. We have also studied tangent sphere bundle as a hypersurface of the tangent bundle of a Riemannian manifold and discussed some curvature properties of the tangent sphere bundle equipped with the induced Sasaki metric and Cheeger-Gromoll metric. Moreover, in the last chapter, we have obtained some new results on the tangent sphere bundle with the general metric
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- Publishing Year** : 2006