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**Title:** Parallel axiom and the 2-nd order differentiability of Busemann functions

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Busemann has introduced a function to develop the theory of parallels in  $G$ -spaces. The function is called the Busemann function after him. Busemann functions have been used in Riemannian and Finslerian geometry at infinity. We study the relation of Parallel Axiom to the 2-nd order differentiability of Busemann functions.

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