Hartogs-type extension for unbounded sets in $\mathbb{C}^2$ via construction of Riemann domains

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Abstract. This paper generalizes the results in [2] about holomorphic extension of CR functions from the boundary of a domain, and gives a class of counterexamples to the conjecture formulated in [2] and [4] that for tube-like domains Ω in $\mathbb{C}^2$ which do not contain complex lines in the closure $\overline{\Omega}$, any CR function defined on the boundary $b\Omega$ can be holomorphically extended to Ω. This investigation has led to interesting new results about Hartogs-type extension for unbounded domains in $\mathbb{C}^2$ via construction of Riemann domains. It should be noted that the Hartogs-type theorems not only play an important role in Complex Analysis of Several Variables, but are also significant in Algebraic Geometry and Partial Differential Equations.

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