



## EXISTENCE AND CLASSIFICATION OF $b$ -CONTACT STRUCTURES

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**Abstract:** A  $b$ -contact structure on a  $b$ -manifold  $(M, Z)$  is a Jacobi structure on  $M$  satisfying a transversality condition along the hypersurface  $Z$ . We show that, in three dimensions,  $b$ -contact structures with overtwisted 3-dimensional leaves satisfy an existence  $h$ -principle that allows us to prescribe the induced singular foliation. We give a method to classify  $b$ -contact structures on a given  $b$ -manifold and use it to give a classification on  $S^3$  with either a 2-sphere or an unknotted torus as the critical surface. We also discuss generalizations to higher dimensions.

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**Key words:**  $h$ -principle, Jacobi structure,  $b$ -contact structure, Poisson structure.