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**Edmund O. Harriss** ([edmund.harriss@imperial.ac.uk](mailto:edmund.harriss@imperial.ac.uk)), Department of Mathematics, Imperial College London, 180 Queens Gate, London, SW7 2AZ, England, and **Jeroen S.W. Lamb\*** ([jeroen.lamb@imperial.ac.uk](mailto:jeroen.lamb@imperial.ac.uk)), Department of Mathematics, Imperial College London, 180 Queens Gate, London, SW7 2AZ, England. *One-dimensional substitution tilings with an interval projection structure.*

We study nonperiodic tilings of the line obtained by a projection method with an interval projection structure. We obtain a geometric characterisation of all interval projection tilings that admit substitution rules and describe the set of substitution rules for each such a tiling. We show that each substitution tiling admits a countably infinite number of nonequivalent substitution rules. We also provide a complete description of all tilings of the line and half line with an interval projection structure that are fixed by a substitution rule. Finally, we discuss how our results relate to renormalization properties of interval exchange transformations (with two or three intervals). (Received January 07, 2007)