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Renormalization conjecture and rigidity theory for circle maps with breaks.

We prove the renormalization conjecture for circle maps with a break, i.e., for circle diffeomorphisms with a single singular point where the derivative has a jump discontinuity. The theorem claims that any two $C^{2+\alpha}$ -smooth ($\alpha > 0$) circle maps with a break, with the same irrational rotation number and the same size of the break, approach each other exponentially fast (in the C^2 -topology). As a corollary, we obtain a strong rigidity statement for such maps: for almost all irrational numbers ρ , any two circle maps with a break, with the same rotation number ρ and the same size of the break, are C^1 -smoothly conjugate to each other. As we proved earlier, the latter claim cannot be extended to all irrational rotation numbers. These results can be considered an extension of Herman theory on the linearization of circle diffeomorphisms. (Received December 01, 2012)