On the Whitney-Holder regularity of the SRB measure in the quadratic family

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For a smooth one-parameter family of smooth hyperbolic discrete-time dynamics (i.e. Anosov systems, which are structurally stable), the SRB measure depends differentiably on the parameter, say t, and the derivative is given by an explicit "linear response" formula (Ruelle, 1997). When structural stability does not hold, the linear response may break down. This was first observed for piecewise expanding interval maps, where linear response holds for tangential families, but where a modulus of continuity t log (t) is possible for transversal families (Baladi-Smania, 2008). The case of smooth unimodal maps is much more delicate. Ruelle (Misiurewicz case) and Baladi-Smania (slow recurrence case) recently obtained linear response for fully tangential families (remaining in a topological class). We now study the transversal case (e.g. the quadratic family), where we obtain Holder upper and lower bounds (in the sense of Whitney, along suitable classes of parameters).