Duffin's superbiharmonic counterexample revisited

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Duffin in 1946 constructed a superbiharmonic function u, i.e. $\Delta^2 u \ge 0$, on the infinite strip $S := \mathbb{R} \times (-1, 1)$ satisfying zero Dirichlet boundary conditions $u = \partial_{\nu} u = 0$ on ∂S , and showed that u changes sign. It was a kind of first counterexample for the Boggio-Hadamard conjecture^{*} from the beginning of the 20th century. We will recall his counterexample, go somewhat further and may find some nice implications.

 $* {\it Superbiharmonic}$ functions on (convex) domains that satisfy zero Dirichlet boundary conditions are nonnegative.