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**David G Costa\*** ([david.costa@unlv.edu](mailto:david.costa@unlv.edu)), Department of Mathematical Sciences, University of Nevada Las Vegas, 4505 S. Maryland Pkwy, Las Vegas, NV 89154-4020. *Multiple Solutions of Elliptic PDEs in Exterior Domains of  $\mathbb{R}^2$ .*

We prove existence of extremal constant-sign solutions and sign-changing solutions in  $D_0^{1,2}(\Omega)$  of the boundary value problem

$$-\Delta u = a(x)f(u) \text{ in } \Omega, \quad u = 0 \text{ on } \partial\Omega = \partial B(0,1),$$

where  $\Omega = \mathbb{R}^2 \setminus \overline{B(0,1)}$  and  $a(x)$  is a nonnegative coefficient satisfying a suitable integrability condition. Our main tool is the Kelvin transform, which we show to be an order-preserving and isometric isomorphism between  $D_0^{1,2}(\Omega)$  and  $H_0^1(B(0,1))$ . Our approach allows to handle sub, super or asymptotically linear nonlinearities  $f(u)$ . This is joint work with S. Carl, M. Fotouhi and H. Tehrani. (Received September 16, 2019)