

1167-46-179

**Michael Maroun\*** (marounm@gmail.com). *The Unique Everywhere Continuous Bound State of the Dirac Delta Potential on  $\mathbb{R}^2$ .*

The Dirac delta potential as a Schrodinger pseudo-potential is proved to have an unique everywhere continuous (on all of  $\mathbb{R}^2$ ) bound state (element of  $L^2(\mathbb{R}^2)$ ). For such an eigenfunction it is possible to determine a corresponding unique eigenvalue. This eigenvalue and eigenfunction differ significantly from that of the method of self-adjoint extension. This is due to the continuity and indeed smoothness at the origin. As a comparison, the harmonic oscillator on the real line with smoothness at the origin has a strictly positive real point spectrum with cardinality of the natural numbers. When the smoothness condition is removed, there are still  $L^2(\mathbb{R})$  eigenfunctions but the cardinality of the point spectrum becomes the continuum. (Received March 06, 2021)