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Wolfram Research is transforming the way the world publishes technical documents with *Wolfram Publicon*—an integrated solution for authoring documents in XML and other structured data formats. *Publicon* provides an easy-to-use graphical interface for creating publication-quality technical documents that integrate text, searchable typeset equations, graphics, hyperlinks, endnotes, and references. Built-in palettes, templates, and style sheets simplify the creation of documents that conform to established formats but also allow for complete customization. *Publicon's* combination of ease of use and cutting-edge technology makes it the first choice for authoring structured technical documents for electronic or print publication.

The screenshot displays a technical document within the Wolfram Publicon interface. The document title is "1.2 The Hill Determinant Method". It contains several mathematical equations and a matrix. The first equation is $-a_0^2(x) + \sum_{k=1}^n a_k \phi_k(x) = a_0 \phi_0(x)$. The second equation is $\phi_k(x) = \frac{1}{\sqrt{x}} e^{-\frac{x^2}{2}} H_k(x)$. The matrix $a_{m,n}$ is defined as $\int_{-\infty}^{\infty} \phi_m(x) (-a_0^2(x) + \sum_{k=1}^n a_k \phi_k(x)) dx$. The matrix elements are given by $a_{m,n} = \int_{-\infty}^{\infty} \frac{2x^{2m-1} e^{-x^2}}{\sqrt{x}} \left((2n+1)a_{m,n-1} - (n-1)^2 + 16(n-3)(n-2)n a_{m,n-2} + 4(n-1)(n+5)a_{m,n-3} + 8(n-1)a_{m,n-4} \right) dx$. A rough estimation shows that one obtains about 0.2 digits per harmonic oscillator state. The Hill determinant approach allows for the calculation of the eigenvalues, the calculation of the eigenvectors. The following graphic visualizes the matrix of eigenvectors of $(a_{m,n})_{1 \leq m,n \leq 100}$. The graphic shows that the lowest eigenfunctions are quite similar to the harmonic oscillator eigenfunctions. Higher states are complicated mixtures of harmonic oscillator states. The overall "checkerboard"-like structure results from the fact that the contribution of the antisymmetric (symmetric) harmonic oscillator states to the symmetric (antisymmetric) subharmonic oscillator states is identical zero. The very high states are dominated by truncation effects and do not correctly mimic the subharmonic oscillator states.

Figure 1: The matrix of eigenvector of $(a_{m,n})_{1 \leq m,n \leq 100}$

The interface also shows a "Default" palette on the right with options like "New Document", "Frontmatter", "Equations", "Graphics", "Tables", "Backmatter", "Outlining", and "Navigation".

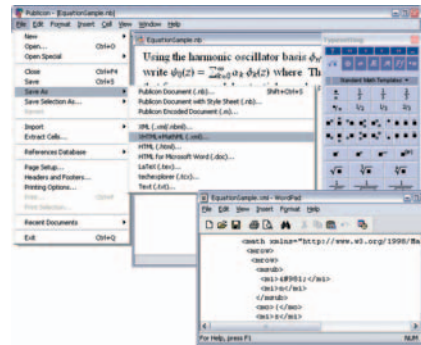
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WolframPublicicon



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