1069-65-7 **Lawrence F Shampine*** (lfshampine@aol.com), 1204 Chesterton Dr., Richardson, TX 75080.
Integrating Oscillatory Functions in MATLAB.

When ω is large, the integrand of $\int_a^b f(x)\, e^{i\omega x}\, dx$ is highly oscillatory and conventional quadrature programs are ineffective. A new method based on a smooth cubic spline is implemented in a MATLAB program `osc` that is both easy to use and effective for large ω. Other methods are used in the program to deal effectively with small ω. Because the implementation of the basic method is adaptive, the program deals comparatively well with $f(x)$ that have peaks. With the assistance of another method, the program is able to deal effectively with $f(x)$ that have a moderate singularity at one or both ends of $[a, b]$. The algorithms and user interface of `osc` exploit the capabilities of the MATLAB computing environment. (Received September 20, 2010)