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**Numerical Quadrature**

**and its Applications**

**Software Section**

by

**G. A. Evans**

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# Contents

| Prog | Title   | Reference   |
|------|---|---|
| 1    | Multiple Precision Arithmetic                       | Algol 68 NAG library  |
| 2    | Interval arithmetic package                         | Algol 68 NAG library  |
| 3    | General standard multidimensional<br>integrator     | *   |
| 4    | An adaptive integrator                              | *   |
| 5    | Newton-Cotes oscillatory integrator                 | <i>C. J.</i> 18, No. 2, (1975)  |
| 6    | Bessel functions                                    | <i>Maths. Res.</i> 53, (1975)   |
| 7    | Finite range oscillatory integrals                  | <i>C. J.</i> 19 No. 3, (1976)   |
| 8    | Infinite range oscillatory<br>integrals             | <i>J. Comp. Phys.</i> 13, (1973)  |
| 9    | The routine infint                                  | <i>J. Comp. Phys.</i> 13, (1973)<br><i>J. Comp. Phys.</i> 22, (1976)            |
| 10   | Singular quadrature with<br>accelerators            | <i>Int. J. Comp. Math.</i> 12, (1983)   |
| 11   | Singular quadratures by<br>transformation           | <i>Int. J. Comp. Maths.</i> 15, (1984)<br><i>Int. J. Comp. Math.</i> 27, (1989) |
| 12   | Two dimensional singular<br>quadrature              | <i>Int. J. Comp. and<br/>Appl. Math.</i> 24, (1988)                             |
| 13   | Three dimensional singular<br>quadrature            | <i>Int. J. Comp. and<br/>Appl. Math.</i> , (1989)                               |
| 14   | Non-linear integral equations                       | <i>Int. J. Comp. Math.</i> 11, (1982)   |
| 15   | Non-linear integral equations<br>variational method | <i>Int. J. Comp. Maths.</i> 22, (1987)  |
| 16   | Hartree-Fock atomic systems                         | <i>Int. J. Quantum Chem.</i> 12, (1977)   |
| 17   | Ion beam model                                      | <i>Vacuum</i> 34, (1984)<br><i>Vacuum</i> 36, (1986)                            |
| 18   | Eddy current model                                  | <i>Proc. Eddy current sem.</i> , (1988)   |

\* These routines implement standard methods and have been used extensively to generate comparative results throughout the work.