Software Packages

MONT3D
This code, developed at Colorado State University by Burns et al. [1–5], calculates radiative exchange factors for complicated, three-dimensional geometries by the Monte Carlo method, as given by equations (8.15) and (8.21). Diffuse and specular view factors may be calculated as special cases. We provide here only a link to the Colorado State University web site, where documentation and codes are kept up-to-date: `http://www.colostate.edu/~pburns/monte.html`

VIEW3D
This code, developed at National Institute of Standards and Technology (NIST) by Walton [6], calculates radiative view factors with obstructions by adaptive integration. The package, as posted here, consists of 4 files:

1. The official NIST publication (`NISTIR-6925.pdf`),
2. A compressed file containing the program executables, help files, etc. (`v3d32exe.zip`),
3. A compressed file containing the program documentation (`V3D32doc.zip`), and
4. A compressed file containing sample data files (`IEA22dat.zip`).

For problems with and/or feedback for this package please address them directly to the author, George Walton (`gwalton@mailserver.nist.gov`).

RADCAL
This code, developed at NIST by Grosshandler [7,8] is a narrow band database for combustion gas properties, using tabulated values and theoretical approximations. The package consist of two files:

1. A user manual (NIST Technical Note `TN 1402.pdf`), and
2. a compressed file containing the program Fortran file and sample input and output files (`RADCAL.zip`).

For problems with and/or feedback for this package please address them directly to the author, William Grosshandler (`wgrosshandler@nist.gov`).

EM2C
This package contains a number of Fortran codes, developed at the Ecole Centrale de Paris by Soufiani and Taine [9], calculating statistical narrow band properties as well as narrow band k-distributions for CO_2 and H_2O, using the HITRAN92 database together with some proprietary French high-temperature extensions. The entire package is provided in the form of a compressed file containing the program Fortran files, data files and documentation (`em2c.zip`). For problems with and/or feedback for this package please address them directly to the authors, Anouar Soufiani (`soufiani@em2c.ecp.fr`) and/or Jean Taine (`taine@em2c.ecp.fr`).

NBKDIR
still under development
This package contains a number of Fortran codes, developed at the Pennsylvania State University and the University of California at Merced by the author and his students/postdocs A. Wang, G. Pal, and J. Cai, for the assembly of full spectrum k-distributions from a narrow band k-distributions database. At the time of printing `NBKDIR` contained data for five species (CO_2, H_2O, CO, CH_4, C_2H_4), as well as nongray soot, for temperatures up to 3000 K and pressures up to 80 bar. Spectroscopic data are taken from the HITEMP 2010 (CO_2, H_2O, CO) [10] and HITRAN 2008 (CH_4, C_2H_4) [11].

FVM2D
This Fortran77 code, developed at the University of Minnesota and Nanyang Technological University by Chai and colleagues [12–14], calculates radiative transfer in participating media using the finite-volume method of Chapter 17 for a two-dimensional, rectangular enclosure with reflecting walls and an absorbing, emitting, anisotropically scattering medium. For each surface the emittance and blackbody intensities must be specified; for the medium spatial distributions of radiation properties and blackbody intensities must be input. Calculated are internal incident radiation (G) and wall flux (q) fields. Can be used for gray problems or on a spectral basis. The package consists of two files:

1. A user manual (`RAT.pdf`), and

2. a compressed file containing the program Fortran files (`RATcode.zip`).

Four modules are needed to run `FVM2D`. These are `PARAM.FOR`, `COMMON.FOR`, `RATmain.FOR` and `ADAPT.FOR`. In this nomenclature, `RATmain.FOR` and `ADAPT.FOR` are the invariant part and the adaptation portion of the program, respectively. `COMMON.FOR` contains all the common block related variables, while `PARAM.FOR` contains the parameters for the program. These files are all contained in `RATcode.zip`, providing the 6 different versions of `ADAPT.FOR` corresponding to the 6 examples described in the manual. The manual as given is preliminary, i.e., two more examples dealing with irregular geometry and non-gray media, respectively, will be added at a later time.
For problems with and/or feedback for this package please address them directly to the author, John (Chee Kiong) Chai (`MCKChai@ntu.edu.sg`).

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