Keep-in-Touch meeting
(July 12, 2021, 2.00pm)

2021 update of the SPARK Line-by-Line "Libre" nonequilibrium radiation code

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This talk presents the recent release of the 3.0 version of the SPARK Line-by-Line (LbL) code. SPARK LbL (formerly called SPARTAN) is a Line-by-Line radiation code specifically tailored for the simulation of radiation from hot, nonequilibrium gases and plasmas. The code has been developed continuously for the last 15 years and applied to solve radiative transfer problems in aerospace applications (namely atmospheric entry spacecraft).

A discussion on the code philosophy and how it compares to similar codes is presented. The code allows for a considerable amount of flexibility for experienced users, allowing for these to tailor its radiative databases for their own needs. Recent developments of such radiative databases are presented and discussed, followed by a presentation of its ray-tracing routine, which is agnostic to different geometries and may be indifferently applied to the simulation of different plasma sources.

The code also provides a series of associated routines and applications which allow building thermodynamic and radiative databases. These are also briefly discussed. The presentation will conclude by a brief outline of the roadmap of current and future developments, namely the work on a FORTRAN-based version of the code.

SPARK LbL is a "Libre" code distributed through a GPLv3 license. A download link is provided for the potentially interested audience.