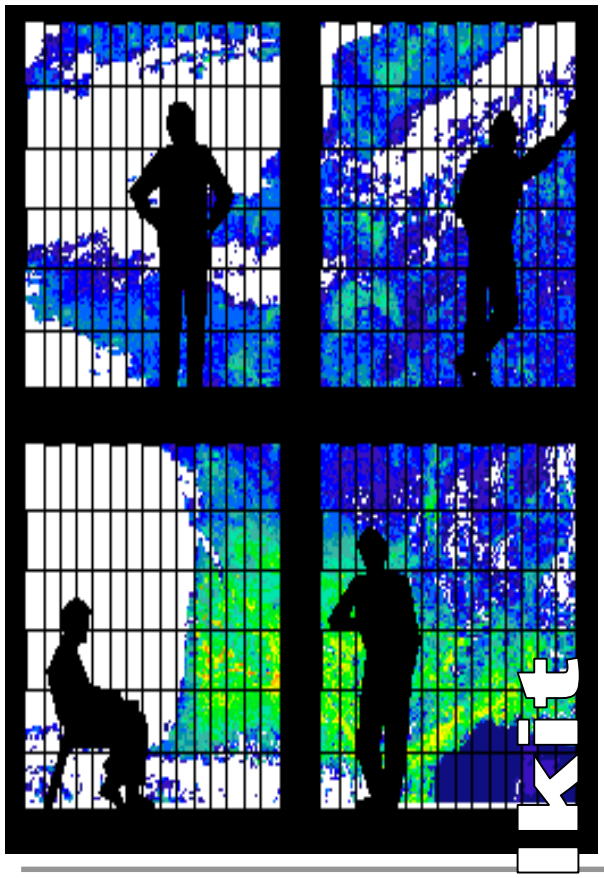
SE-THERMAL

Code

Thermal



3D scene

toolkit

Compute Temperature of your 3D Scene

THERMAL MODELLING TOOL

SE-THERMAL toolkit is a set of tools dedicated to the calculation of all the possible temperature states of a scene at a given time of the day for given atmospheric conditions. The tools take into account the history of thermal and atmospheric conditions for shadow-effects computation and associate temperature with a virtual 3D scene

SE-THERMAL features:

Temperature calculation of polygons of a 3D terrain

Take into account 3D masking involved by the 3D terrain

Function of atmospheric conditions

Open to external temperature computation code as RADTHERM™ IR dedicated to 3D objects or SHIPIR™ dedicated to naval domain

Used to make generic thermal computations

Validation:
A Validation Dossier is delivered with the software in order to assess the quality of the code.
For the validation of the β–version 5, a special cross validation dossier is provided.

Options:
The thermal shadow resolution can be enhanced. The thermal shadows are computed by SE-RAY-IR directly and licensed through SE-THERMAL-SHADOW option. See SE-RAY-IR for more details.

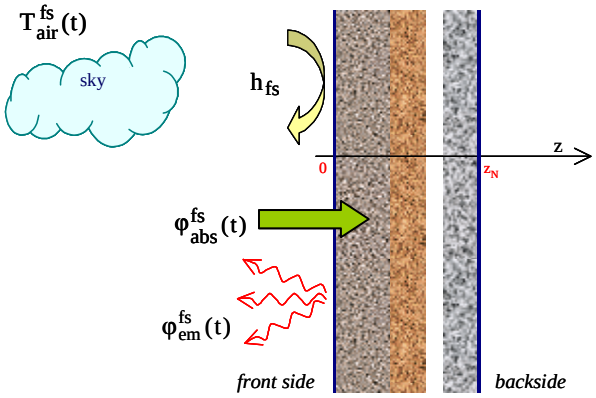
Dependence
The physical realism that can be achieved with the SE-THERMAL toolkit mainly depends on the quality of the input data, which are:
1. The environment data (atmospheric files),
2. The thermal description of the materials.

Polygons temperature calculation
The database is considered to be previously characterized with physical data and is used in correlation with an atmospheric conditions file

Based on the ray-tracing engine SE-RAY-IR and the numerical model in β–version 5 (previously based on MURET developed with ONERA).

3D masking
Realistic computation of incident atmospheric fluxes, taking into account masking within the 3D database.

History taking into account
The history of thermal and atmospheric background, and particularly the shading effects of one object on another (or on the ground) are taken into account in the computation.



Type of polygons
Deals with « isolated polygons » and « warmed polygons » (for which an inner temperature is user defined).

Inner heat sources
Computed with user defined heat flux.

Influence of wind
The wind and its direction is taken into account.

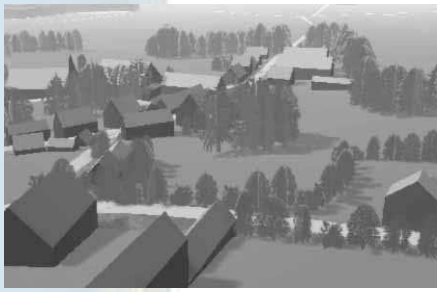
Physical phenomenon
Diffuse terrain reflection is taken into account in the flux computation of non-horizontal polygons. Diffuse sky and terrain irradiance are depending on the altitude.

SE-TH-MTC
- Computes the temperature of each materials of the physical material database as function of given atmospheric conditions.
- Used to prepare SE-RAY-IR computation and SE-FAST-IR rendering.

SE-TH-PTC
- Used to compute mean polygon temperatures as function of atmospheric conditions. Indeed, once computed with SE-TH-PTC, the mean polygons temperatures can be displayed and eventually patched with SE-PHYSICAL-MODELER.

Benefits:
Well adapted for 3D terrain temperature calculation
High Efficiency: Allows managing large database in reasonable computation time.

System requirements :
Windows 2000 and XP
Linux Red Hat Entreprise 4



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