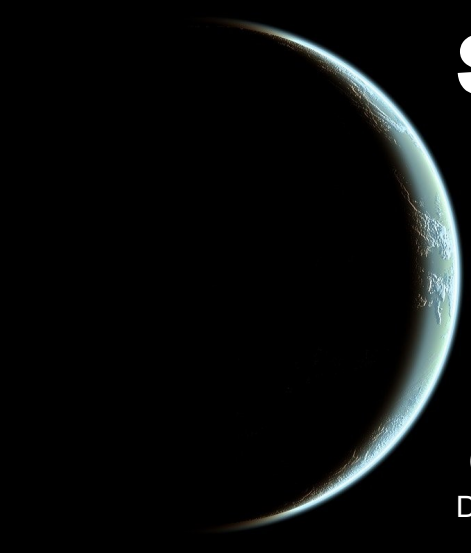
SYSTEMA NEWSLETTER

We are delighted to present the **second issue** of our newsletter ! This **Systema newsletter** presents our **latest news**, **new features** as well as **tips & tricks** and many others.



SYSTEMA 4.9.4 VERSION AVAILABLE !

Systema 4.9.4 release is **available** !

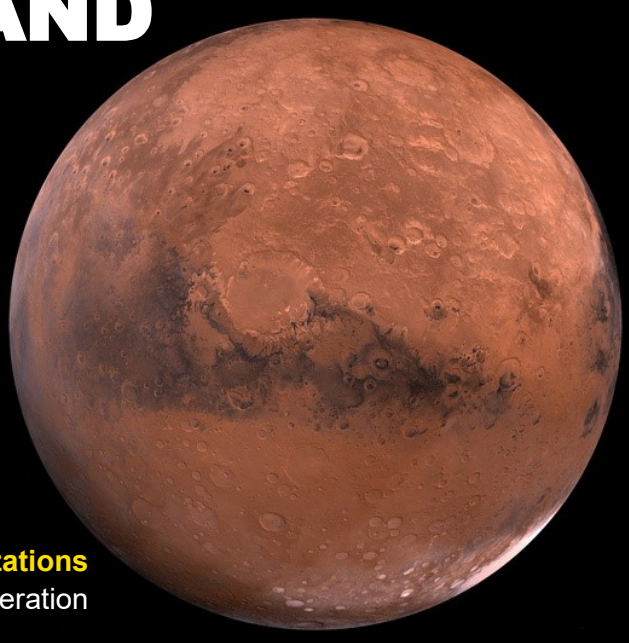
For further details, please refer to the release note and the user manual available on our **website** by clicking **here**.

To download the version, do not hesitate to **contact our support team**.

Systema-4.9.4 replaces version 4.9.2 as the new **Long Term Support** (LTS) version.

Do not hesitate to **come visit us !**

NEW FEATURES AND ENHANCEMENTS



Systema-4.9.4 release is packed with improvements, optimizations, and new features, designed to enhance performance, usability, and accuracy for satellite modeling.

There have been several improvements to the **Python API**, responding to **user feedback**, making it easier for developers to interact with Systema for custom modeling and automation tasks.

Across multiple modules, several **performance optimizations** and **bug fixes** have been applied to ensure smoother operation and more efficient modeling workflows.

In the Modeler, we have introduced several updates to improve usability. You can now **sort materials** alphabetically via the right-click menu, and this is also available as a default setting. Additionally, a scrollbar has been added to manage discrete scales in 3D views, allowing for better visualization.

We have enhanced **ray tracing performance** in specific scenarios, providing faster results with increased accuracy. We have also improved the precision of re-emission rate calculations for Quasi Monte-Carlo methods which are critical for thermal analysis.

Regarding file compatibility, Systema 4.9.4 introduces **TMM export** functionality in **STEP-TAS format**. This allows a portion of the thermal mathematical model (TMM) to be exported along with the geometrical model (GMM). The data exported include node properties such as name, capacitance, dissipation and initial temperature, as well as radiative and conductive couplings.

There are also significant improvements in the **specific items**, with a new option on *Surface Contact* specific item to adjust the number of rays fired per mesh based on ray density and mesh area. On *Capacitance* and *Internal Dissipation* specific items we added the ability to **distribute values** across all selected nodes instead of duplicating it. For capacitance, values are distributed proportionally based on geometric area and for dissipation, the distribution can be based on either geometric area or capacitance.

Finally, we have introduced new **export options** for planet and solar fluxes, including the ability to export direct and indirect absorbed fluxes and a new option to export the Sun angle (the angle between anode's normal and the Sun's direction vector) to the .nwk file, allowing for more detailed analysis.

Additionally, we are pleased to announce the introduction of a **new Emission Source module**, expanding the capabilities of Systema even further.

EMISSION SOURCE MODULE

FEATURES

The **Emission Source** module simulates the thermal flux exchanges between **UV/IR lamps** and the geometrical nodes of the model.

This module is designed to fully replace the "Solar Lamp" specific item, whose outputs are generated by the Nodal Description module. Although the "Solar Lamp" specific item has been retained for compatibility reasons, it is highly recommended to use the Emission Source module now, as it offers at least the same capabilities and even more due to **additional functionalities** and fewer limitations.

Additionally, this is a **standalone module**, which allows the generation of various dedicated output files such as .nwk, .h5 and files for ray visualization.

The Emission Source module operates with a new specific item named "**Point Source**", which enables the placement of UV/IR lamps on the surfaces of the model. The user needs to create at least one Point Source specific item to be able to run the Emission Source module.

COMPARISON TO SOLAR LAMP SPECIFIC ITEM

	Solar Lamp Specific item	Emission source module
Multiple lamp simulation	Not supported ✗	Supported ✓
Dual emission capability (UV & IR)	Either UV or IR	UV, IR or both UV and IR simultaneously
Parametric flux definition	Not available ✗	Available in .nwk file ✓
Versatile ray tracing	Ray emission in normal direction only	Ray emission in all directions (Lambert's law) or normal direction
3D ray visualization	Not available ✗	Supported ✓
Data Storage	Fluxes in nwk file	Fluxes in nwk file, fluxes and couplings in h5 file
Time-Dependent emitted flux (user input)	Not available ✗	Supported (only in the .nwk output, not in the emi.h5 file) ✓

By leveraging these enhanced features, the Emission Source module provides a more comprehensive and flexible tool for modeling and predicting **satellite test** outcomes.

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