

GALPROP WebRun

galprop.stanford.edu



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for the GALPROP development team

What's new in v.54

- Shared-memory parallel support with OpenMP: multi-processor machines
- Memory usage optimization
- HEALPix output of γ -ray and synchrotron skymaps
- MapCube output for compatibility with Fermi-LAT Science Tools software
- γ -ray skymaps output in Galactocentric rings to facilitate spatial analysis of the Galactic diffuse γ -ray emission
- More accurate line-of-sight integration for computing diffuse emission skymaps
- 3D modeling of the Galactic magnetic field, both regular and random components
- Calculations of synchrotron skymaps, using both regular and random magnetic fields
- New improved gas maps, which are computed using recent H I and CO surveys
- A new calculation of the Galactic interstellar radiation field using the FRANKIE code
- Increased efficiency of anisotropic inverse Compton scattering calculations
- GALPROP code is compiled to a library for easy linking with other codes (e.g., DarkSUSY, SuperBayeS)
- Improved configuration management via the GNU autotools. Multiple *NIX system and compiler targets (gcc, intel, llvm, open64) are supported

GALPROP WebRun

- GALPROP WebRun is a service that allows to run GALPROP via the WWW
- No local installation of the code or related libraries is necessary, only a web browser is required
- Available at <http://galprop.stanford.edu/webrun>
- Calculations can be performed on a new cluster at Stanford University, using the most recent GALPROP v54, older versions are also available
- The service is free and open to the community. Registration is required
- Acknowledge by citing the web-page and the introduction paper <http://arxiv.org/abs/1008.3642> (submitted to Computer Physics Communications)

Configuring GALPROP via WebRun

The screenshot shows the GALPROP WebRun interface in a browser window. The URL is <http://galprop.stanford.edu/webrun/>. The page features a navigation menu with links for CODE, WEBRUN (selected), FORUM, RESOURCES, PUBLICATIONS, CONTACTS, and BUGS?. A search bar is present, and a 'Logout [avladim]' link is visible. The main content area is titled 'Enter the desired GALPROP v. 54 parameters and click 'Submit' at the bottom of the form'. Below this, there are tabs for 'Common', 'Grids', 'Propagation', 'Gas', 'Sources', 'Emission', and 'Abundances'. The 'Common' tab is active, showing a table of parameters. Below this, there are sections for 'Energetic and Spatial Grids' and 'CR Propagation', each with their own parameter tables. A sidebar on the left contains 'WebRun Help' (with sub-links for 'Configure & Submit', 'First-time User Mode', and 'Advanced User Mode'), 'Monitor Queue', and 'Download Results'. A footer note says 'Please remember to cite GALPROP'.

Common Parameters

Name	Value	Description
Title	Plain diffusion mod	Descriptive title used to identify the run.
n_spatial_dimensions	2	Specifies whether 2 or 3 spatial dimensions.

Energetic and Spatial Grids

Name	Value	Description
r_min	00.0	Minimum galactocentric radius (R) for 2D case, in kpc. Ignored for 3D.
r_max	20.00	Maximum galactocentric radius (R) for 2D case, in kpc. Ignored for 3D.
dr	1.0	Cell size in galactocentric radius (R) for 2D case, in kpc.
z_min	-4.0	Minimum height for 2D and 3D case, in kpc.
z_max	+4.0	Maximum height for 2D and 3D case, in kpc.
dz	0.1	Cell size in z for 2D and 3D case, in kpc

CR Propagation

Name	Value	Description
D0_xx	2.2e28	The spatial diffusion coefficient divided by beta=v/c at rigidity D_rigid_br. The value at other rigidities is determined via the formula $D = \beta D_{0xx} (\rho / D_{rigid_br})^{D_g}$, where $D_g = D_{g_1}$ for rigidity less than D_{rigid_br} , and $D_g = D_{g_2}$ for rigidity greater than D_{rigid_br} .
D_rigid_br	3.0e3	Rigidity for D0_xx formula, and also break point in case $D_{g_1} \neq D_{g_2}$.
D_g_1	0.	Diffusion coefficient index below reference rigidity. See formula for D0_xx. Kolmogorov turbulence corresponds to a value 1/3.
D_g_2	0.60	Diffusion coefficient index below reference rigidity. See formula for D0_xx. Kolmogorov turbulence corresponds to a value 1/3.

- Interactive interface for parameter entry
- Parameters are validated to avoid misconfigured runs