

# Instructions for uploading data to LXCat databases for electron swarm parameters

The LXCat team  
Version February 2022

These instructions use as an example the LAPLACE database on LXCat.

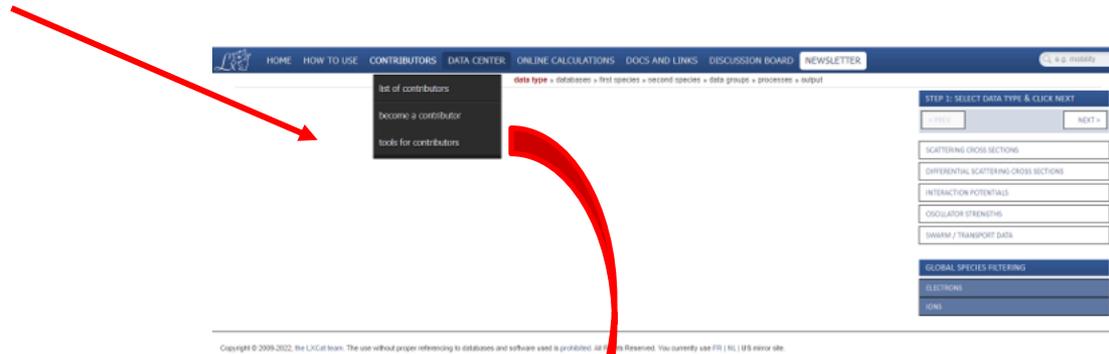
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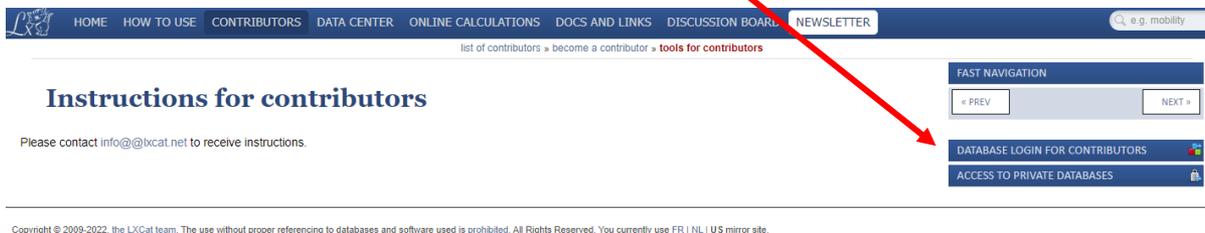
# Accessing the login page (1)

1. Go to [www.lxcat.net](http://www.lxcat.net)

Click on "tools for contributors".



2. Click on "database login for contributors".



## Accessing the login page (2)

3. Login using information sent by the LXCat team.

Login page



The screenshot shows the phpMyAdmin login interface. At the top, there is a logo for phpMyAdmin featuring a sailboat and the text "phpMyAdmin". Below the logo, it says "Welcome to phpMyAdmin". There is a "Language" dropdown menu currently set to "English". Below that is a "Log in" button with a blue arrow icon. The login form itself has two input fields: "Username:" and "Password:". A red box highlights these two fields. At the bottom right of the form is a "Go" button, which is also circled in red. A red arrow points from the text "3. Login using information sent by the LXCat team." to the "Log in" button area, and another red arrow points from the text "4. Click on « go »." to the "Go" button.

phpMyAdmin  
Welcome to phpMyAdmin

Language  
English

Log in

Username:

Password:

Go

4. Click on « go ».

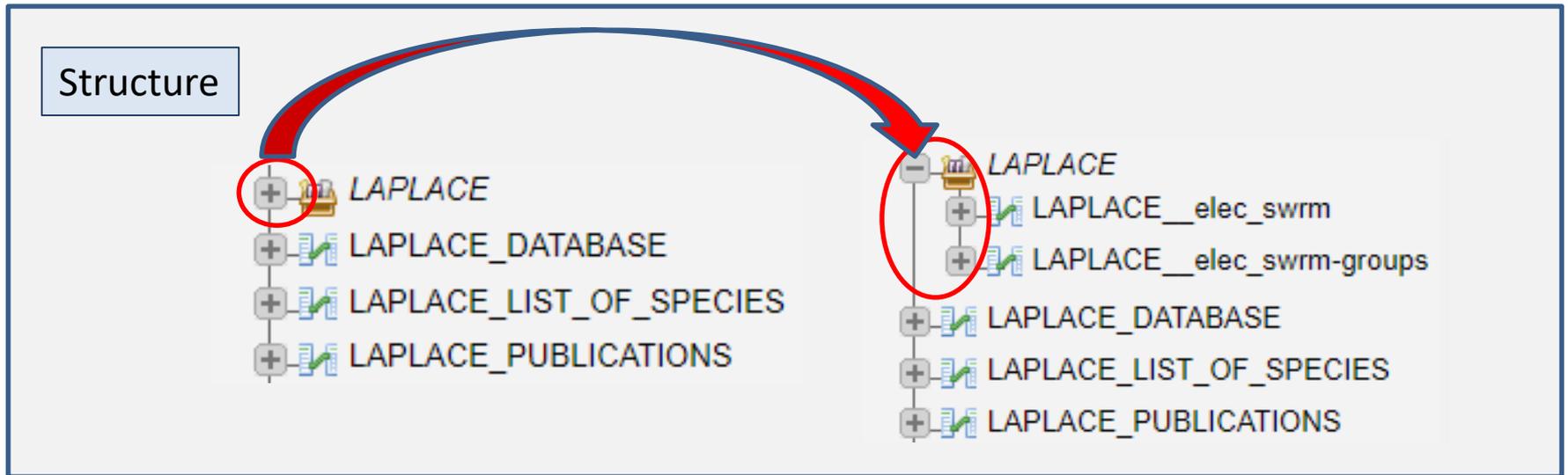
# Account information page

- 1) Change password, if desired.
- 2) Change language, if desired (English is preferred).
- 3) Click on the symbol "+" next to lxcat\_contributors to enter the database.

The screenshot shows the phpMyAdmin interface for a server at localhost:3306. The left sidebar shows a tree view of databases, with 'lxcat\_contributors' selected and highlighted by a red box labeled '3)'. The main content area is divided into several sections:

- General settings:** Contains a 'Change password' button highlighted by a red box labeled '1)'. Below it is a 'Server connection collation' dropdown menu set to 'utf8mb4\_unicode\_ci'.
- Appearance settings:** Contains a 'Language' dropdown menu set to 'English', highlighted by a red box labeled '2)'. Other options include 'Theme' (pmahomme) and 'Font size' (82%).
- Database server:** Lists server details: Localhost via UNIX socket, MariaDB, version 10.1.26, user leanne@localhost, and UTF-8 charset.
- Web server:** Lists web server details: Apache/2.4.25, libmysql - mysqlnd 5.0.12-dev, PHP extension: mysqli, curl, mbstring, and PHP version: 7.0.27-0+deb9u1.
- phpMyAdmin:** Lists version information (4.6.6deb4) and links to documentation, official homepage, contribute, get support, list of changes, and license.

# Database structure and contents using the LAPLACE database as an example



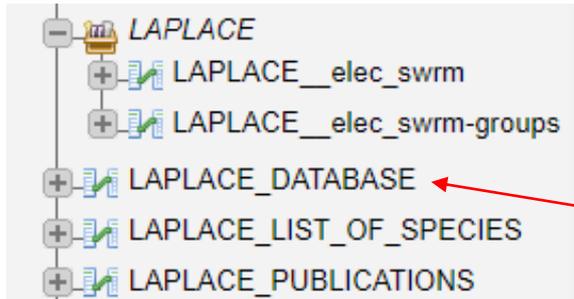
Element name	Contents
LAPLACE	
LAPLACE__elec_swrn	Electron swarm data tables and information describing each process.
LAPLACE__elec_swrn_groups	Group names, if any, with identifying information.
LAPLACE_DATABASE	Description of the database as a whole, with contact information for the contributors. This information appears under "List of Contributors".
LAPLACE_LIST_OF_SPECIES	List of species/gas mixtures for which data are available in this database.
LAPLACE_PUBLICATIONS	Publication, notes, conference communications, etc.

# How to input data to a swarm database

1. Provide a short description of the database in "LAPLACE\_DATABASE".
2. Provide a list of target species in "LAPLACE\_LIST\_OF\_SPECIES".
3. Provide (optionally) a list of group names in "LAPLACE\_\_elec\_swrm\_groups".
4. Upload data in the file "LAPLACE\_\_elec\_swrm".

We will now walk through these steps.....

# Step 1: Short description of the database (1)



Click to open a summary page

A screenshot of a table view. The table has the following columns: PUBLIC, VAMDC, FULL NAME, DESCRIPTION, CONTACT, HOW TO REFERENCE, and KEY (AUTO). The first row of data is: PUBLIC: ON, VAMDC: OFF, FULL NAME: measurements after 1975, DESCRIPTION: These data were extracted from articles published ..., CONTACT: (empty), HOW TO REFERENCE: (empty), KEY (AUTO): 1. The 'Edit' button in the first row is circled in red, with a red arrow pointing to it from the text 'Click here to open the input page'.

	PUBLIC	VAMDC	FULL NAME	DESCRIPTION	CONTACT	HOW TO REFERENCE	KEY (AUTO)
<input type="checkbox"/> Edit	ON	OFF	measurements after 1975	These data were extracted from articles published ...			1

Click here to open the input page

# Step 1: Short description of the database (2)

## Input page

The screenshot shows a web interface for defining database parameters. The interface has a menu bar with 'Browse', 'Structure', 'SQL', 'Search', 'Insert', 'Export', 'Import', and 'Operations'. Below the menu is a table with columns 'Column', 'Type', 'Function', 'Null', and 'Value'. The table contains the following rows:

Column	Type	Function	Null	Value
PUBLIC	enum	--	<input checked="" type="radio"/> ON <input type="radio"/> OFF	
VAMDC	enum	--	<input type="radio"/> ON <input checked="" type="radio"/> OFF	
FULL NAME	varchar(1024)			<input type="text" value="measurements after 1975"/>
DESCRIPTION	text			<input type="text" value="These data were extracted from articles published after the 1975 or not appearing in the review article by Dutton (and the associated 'Dutton' database). The data in this database were digitized by S Chowdhury (LAPLACE, Toulouse) from figures in the publications or from data tables if tables were provided in the publications."/>
CONTACT	text			<input type="text" value="leanne.pitchford@laplace.univ-tlse.fr"/>
HOW TO REFERENCE	text			<input type="text"/>
KEY (AUTO)	enum	--	<input checked="" type="radio"/> 1	

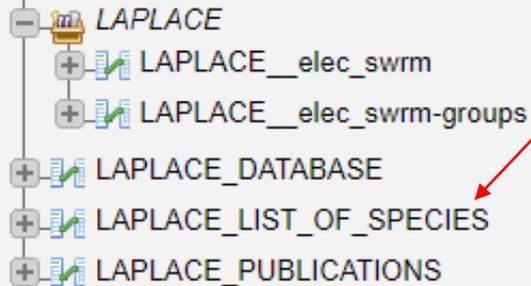
## Definitions of the parameters

Parameter	Definition
<b>PUBLIC</b>	ON => database is visible to everyone OFF => database is visible only to the owner (useful for debugging).
<b>VAMDC</b>	This parameter is no longer used.
<b>FULL NAME</b>	Optional
<b>DESCRIPTION</b>	This information is displayed on the LXCat website at <a href="http://www.lxcat.net/LAPLACE">www.lxcat.net/LAPLACE</a> .
<b>CONTACT</b>	Names and contact information for the contributors of this database.
<b>HOW TO REFERENCE</b>	References to the database as a whole, if any.

This is incremented automatically in LXCat. Don't modify.

Click "Go" save and exit.

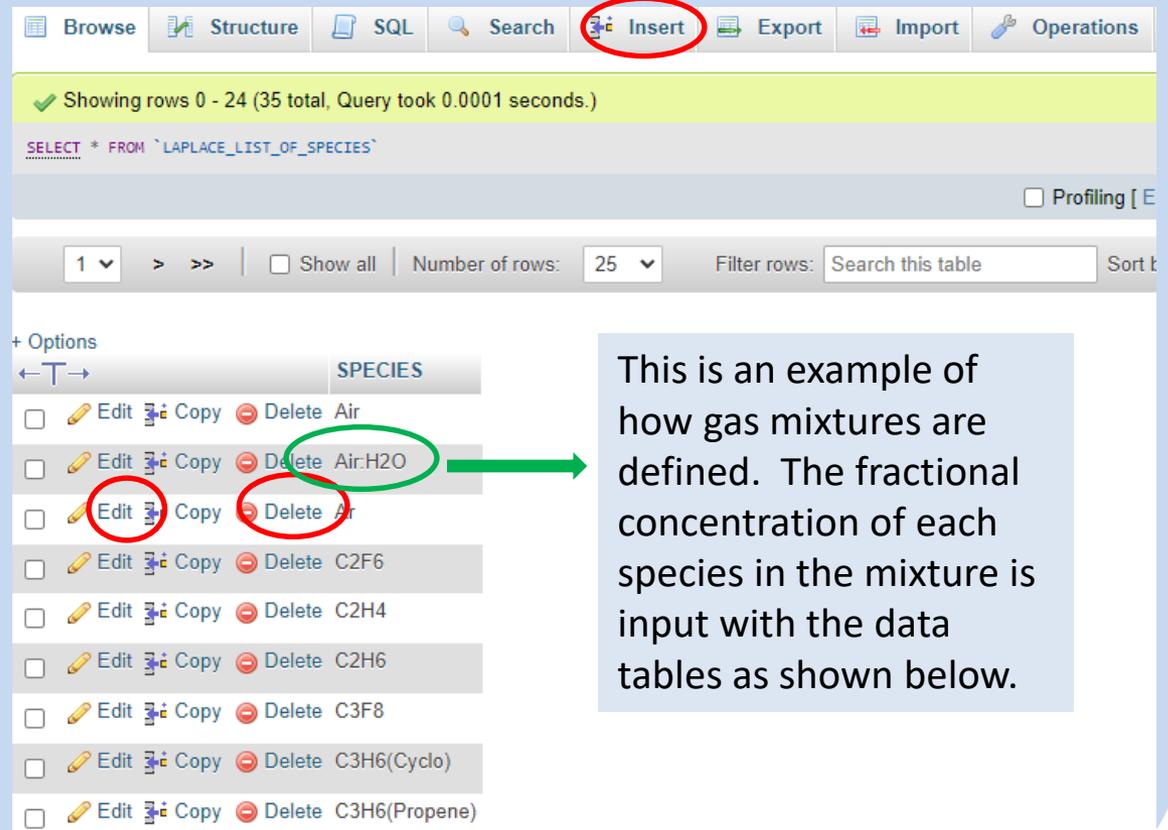
## Step 2: List of target species in the database



LAPLACE  
+ LAPLACE\_\_elec\_swrm  
+ LAPLACE\_\_elec\_swrm-groups  
+ LAPLACE\_DATABASE  
+ LAPLACE\_LIST\_OF\_SPECIES  
+ LAPLACE\_PUBLICATIONS

1. Click to open

2. New species names can be inserted and existing data can be modified or deleted by clicking on the buttons outlined in red.



Browse Structure SQL Search **Insert** Export Import Operations

Showing rows 0 - 24 (35 total, Query took 0.0001 seconds.)

```
SELECT * FROM `LAPLACE_LIST_OF_SPECIES`
```

Profiling [ E

1 > >> Show all Number of rows: 25 Filter rows: Search this table Sort t

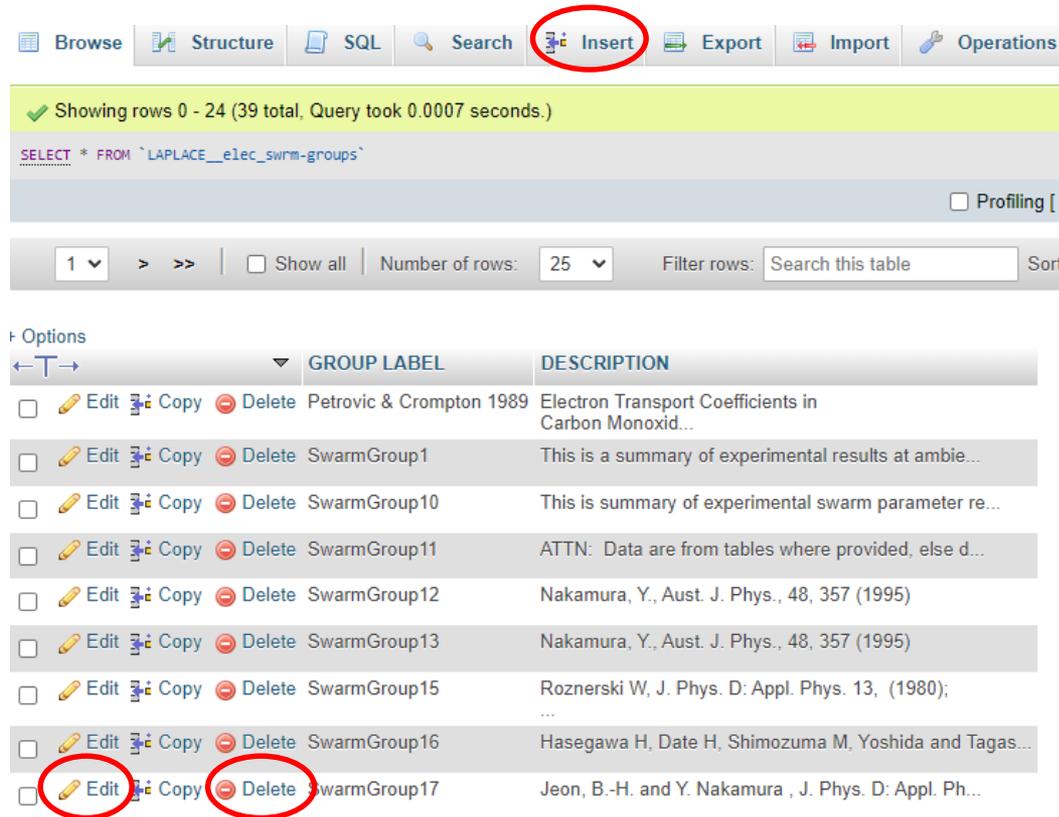
+ Options

				SPECIES
<input type="checkbox"/>	Edit	Copy	Delete	Air
<input type="checkbox"/>	Edit	Copy	Delete	Air:H2O
<input type="checkbox"/>	Edit	Copy	Delete	Ar
<input type="checkbox"/>	Edit	Copy	Delete	C2F6
<input type="checkbox"/>	Edit	Copy	Delete	C2H4
<input type="checkbox"/>	Edit	Copy	Delete	C2H6
<input type="checkbox"/>	Edit	Copy	Delete	C3F8
<input type="checkbox"/>	Edit	Copy	Delete	C3H6(Cyclo)
<input type="checkbox"/>	Edit	Copy	Delete	C3H6(Propene)

This is an example of how gas mixtures are defined. The fractional concentration of each species in the mixture is input with the data tables as shown below.

## Step 3: List of group names (optional)

It is possible to organize the data into "groups" with common properties, but this is optional.



The screenshot shows a database interface with a toolbar at the top containing buttons for Browse, Structure, SQL, Search, Insert, Export, Import, and Operations. The 'Insert' button is circled in red. Below the toolbar, a green status bar indicates 'Showing rows 0 - 24 (39 total, Query took 0.0007 seconds.)'. A SQL query is displayed: `SELECT * FROM `LAPLACE__elec_swrm-groups``. Below the query, there are controls for 'Number of rows' (set to 25) and a 'Filter rows' search box. The main area shows a table with columns 'GROUP LABEL' and 'DESCRIPTION'. The table contains several rows, with the last row, 'SwarmGroup17', having its 'Edit' and 'Delete' buttons circled in red.

	GROUP LABEL	DESCRIPTION
<input type="checkbox"/>	Petrovic & Crompton 1989	Electron Transport Coefficients in Carbon Monoxid...
<input type="checkbox"/>	SwarmGroup1	This is a summary of experimental results at ambie...
<input type="checkbox"/>	SwarmGroup10	This is summary of experimental swarm parameter re...
<input type="checkbox"/>	SwarmGroup11	ATTN: Data are from tables where provided, else d...
<input type="checkbox"/>	SwarmGroup12	Nakamura, Y., Aust. J. Phys., 48, 357 (1995)
<input type="checkbox"/>	SwarmGroup13	Nakamura, Y., Aust. J. Phys., 48, 357 (1995)
<input type="checkbox"/>	SwarmGroup15	Roznerski W, J. Phys. D: Appl. Phys. 13, (1980); ...
<input type="checkbox"/>	SwarmGroup16	Hasegawa H, Date H, Shimosuma M, Yoshida and Tagas...
<input type="checkbox"/>	SwarmGroup17	Jeon, B.-H. and Y. Nakamura, J. Phys. D: Appl. Ph...

New data can be inserted and existing data can be modified by using the buttons in outlined in red.

In the above example, a group name is used to identify all data from a given reference. Groups could be defined differently. For example, all data measured at a given gas temperature could part of a group named "GasTemp=77K".

# Step 4: Upload data (1)

Below is the summary page showing several rows of data in the LAPLACE database.

New data can be inserted and existing data can be modified or deleted by clicking on the buttons outlined in red. Click on "search" to find specific lines of data.

The screenshot shows a database management interface with a top menu bar containing 'Browse', 'Structure', 'SQL', 'Search', 'Insert', 'Export', 'Import', 'Operations', and 'Tracking'. Below the menu is a search bar with 'Table search', 'Zoom search', and 'Find and replace' options. A green status bar indicates 'Showing rows 0 - 5 (6 total, Query took 0.0002 seconds.)'. Below this is a SQL query: `SELECT * FROM 'LAPLACE__elec_swrm' WHERE 'TARGET SPECIES' LIKE 'Air:H2O'`. A toolbar shows 'Profiling [ Edit inline ] [ Edit ] [ Explain SQL ] [ Create PHP code ] [ Refresh ]'. Below the toolbar is a filter section with 'Show all', 'Number of rows: 25', 'Filter rows: Search this table', and 'Sort by key: None'. The main table has columns: 'Options', 'TARGET SPECIES', 'FRACTION', 'TYPE OF DATA', 'GAS TEMPERATURE in K', 'GROUP LABEL', 'THIS DATA COMMENT', 'DATA', 'LAST UPDATE', and 'ID (AUTO)'. The table contains 6 rows of data. Red circles highlight the 'Search' button in the top menu and the 'Edit', 'Copy', and 'Delete' buttons for each row.

Options	TARGET SPECIES	FRACTION	TYPE OF DATA	GAS TEMPERATURE in K	GROUP LABEL	THIS DATA COMMENT	DATA	LAST UPDATE	ID (AUTO)
<input type="checkbox"/> Edit Copy Delete	Air:H2O	80:20	MOBILITY X GAS DENSITY (muN): Td   (m.V.s)-1	0	SwarmGroup11	Ruiz et al 2009 (Air: H2O; 80:20)	8.11131 1.18354E24 9.07521 1.23679E24 10.08352 1...	2012-09-18 15:01:32	3
<input type="checkbox"/> Edit Copy Delete	Air:H2O	90:10	MOBILITY X GAS DENSITY (muN): Td   (m.V.s)-1	0	SwarmGroup11	Ruiz et al 2009 (Air: H2O; 90: 10)	4.53139 2.07027E24 5.59426 2.10335E24 6.06263 2....	2012-09-18 15:00:59	4
<input type="checkbox"/> Edit Copy Delete	Air:H2O	95:5	MOBILITY X GAS DENSITY (muN): Td   (m.V.s)-1	0	SwarmGroup11	Ruiz et al 2009 (Air: H2O; 95:5)	1.61103 3.58011E24 1.80498 3.62868E24 2.00552 3....	2012-09-18 15:02:11	5
<input type="checkbox"/> Edit Copy Delete	Air:H2O	98.5:1.5	MOBILITY X GAS DENSITY (muN): Td   (m.V.s)-1	0	SwarmGroup11	Milloy et al 1975 (Air: H2O; 98.5: 1.5)	0.59413 8.64264E24 0.67172 8.27865E24 0.74931 8....	2012-09-18 15:00:22	6
<input type="checkbox"/> Edit Copy Delete	Air:H2O	98:2	MOBILITY X GAS DENSITY (muN): Td   (m.V.s)-1	0	SwarmGroup11	Ruiz et al 2009 (air: H2O; 98:2)	1 7.66799E24 1.21462 7.41959E24 1.39364 7.59989E...	2012-09-18 15:01:52	7
<input type="checkbox"/> Edit Copy Delete	Air:H2O	99:1	MOBILITY X GAS DENSITY (muN): Td   (m.V.s)-1	0	SwarmGroup11	Ruiz et al 2009 (Air: H2O; 99:1)	0.13293 8.15121E25 0.16567	2012-11-12 12:35:01	8

The next slides define the columns and show how to upload the actual data.

# Step 4: Upload data (2)

## Input page

The screenshot shows a web-based form with the following fields:

- TARGET SPECIES:** varchar(128), dropdown menu with 'Air:H2O' selected.
- FRACTION:** varchar(128), text input with '80:20'.
- TYPE OF DATA:** enum, dropdown menu with 'MOBILITY X GAS DENSITY (muN): Td | (m.V.s)-1' selected.
- GAS TEMPERATURE in K:** float, dropdown menu with '0' selected.
- GROUP LABEL:** varchar(128), dropdown menu with 'SwarmGroup11' selected.
- THIS DATA COMMENT:** text, text area with 'Ruiz et al 2009 (Air: H2O; 80:20)'. A tooltip is visible over this field listing various parameters and their units.
- DATA:** mediantext, dropdown menu with a list of numerical data points.
- LAST UPDATE:** timestamp, dropdown menu with '2012-09-18 15:01:32'.
- ID (AUTO):** int(10) unsigned, dropdown menu with '3'.

These parameters are incremented automatically in LXCat. Don't modify.

Click "Go" save and exit.

Parameter	Definition
<b>TARGET SPECIES</b>	To be selected from the previously defined list of species.
<b>FRACTION</b>	If the target species is a gas mixture, the relative concentrations are defined here. For a 72/25 mixture of N2/O2 , the species is N2:O2 and the fraction is 75:25.
<b>TYPE OF DATA</b>	To be selected from the list of allowed types: <div style="border: 1px solid black; padding: 5px; font-size: small;">           MOBILITY X GAS DENSITY (muN): Td   (m.V.s)-1            DIFFUSION x GAS DENSITY (DN): Td   (m.s)-1            REDUCED IONIZATION COEFFICIENT (alphaN): Td   m2            REDUCED ATTACHMENT COEFFICIENT (etaN): Td   m2            REDUCED NET COEFFICIENT (alpha/N-eta/N): Td   m2            CHARACTERISTIC ENERGY (D/mu): Td   eV            REACTION RATE (k): Td   m3/s            ENERGY DISTRIBUTION FUNCTION (f0): eV   eV-3/2         </div>
<b>GAS TEMPERATURE</b>	Tg = 0 if the corresponding gas temperature is unknown. Otherwise, this is Tg in K.
<b>GROUP LABEL</b>	To be selected from the previously defined list of data groups or NULL (=> blank).
<b>THIS DATA COMMENT</b>	Additional information if needed (reference, for example).
<b>DATA</b>	2-column data table (E/N, swarm parameter) SI units : E/N in Townsend* and swarm parameters in the units defined above.

\*1 Townsend = 1 Td = 10<sup>-21</sup> V m<sup>2</sup>

## Step 4: Upload data (3)

The data tables can be **inserted manually** on the input page  
.....OR users can **import** data for multiple processes simultaneously by creating a file in SQL format.

**INSERT** data: Click on the button in upper horizontal bar. Data tables are inserted by hand (or cut and paste from another application). It is recommended that new users begin by inserting data in this way to become familiar with the options.

OR users can **IMPORT** data in SQL format (see below). Multiple processes can be uploaded in a single SQL file.

Note that contributors can delete or modify their data at any time. Data as they existed at any date in the past can be retrieved by using the TIME MACHINE option (click on « access to previous version ») from the « data center » on LXCat.

## Step 4: Upload data (4)

OR users can **IMPORT** data: Click on "import" to upload a data file in the following format:

```
INSERT INTO `LAPLACE__elec_swrm` (`TARGET SPECIES`, `FRACTION`, `TYPE OF DATA`, `GAS TEMPERATURE in K`, `GROUP LABEL`, `THIS  
DATA COMMENT`, `DATA`) VALUES  
(`Air`, "", `MOBILITY X GAS DENSITY (muN): Td | (m.V.s)-1`, 0, `SwarmGroup11`, `Rees 1973 (Dry air)`,  
'0.40081      9.94975E24  
0.48939      9.09199E24  
0.60675      7.96324E24  
0.81270      7.08113E),  
(`Air`, "", `MOBILITY X GAS DENSITY (muN): Td | (m.V.s)-1`, 0, `SwarmGroup11`, `Roznerski et al 1984`,  
'0.47055      9.54861E24  
2.4742       3.96265E24  
5.03947      2.67778E24  
7.48836      2.25774E24);
```

Between the parenthesis in the first line of the file to be IMPORTED are the names of the columns.  
(There is no carriage return/line feed; this is one long line.)

Attention: Be careful with the symbol " ` " in the first line - this is not the same as the symbol " ' " which appears in the subsequent lines.

Note that there are **two underline symbols** in LAPLACE\_\_elec\_swrm.

In the IMPORT example on the previous page, the SQL file contains mobility data for two different gas mixtures. Data are each mixture are given for each of the columns named in the first line. A comma at the end of the list of data indicates that further data follow. A semicolon at the end of the list of data signals the end of the input data.

If you have any problems, contact the LXCat team at

[info@lxcat.net](mailto:info@lxcat.net).