

USpekPy Package

Uncertainty estimation on protection quantities for x-rays using SpekPy and Monte Carlo techniques

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What is USpekPy?

- **Python package:** Open source and GPLv3-licensed library compatible with Python 3 [▶ Go](#)
- **Goal:** Compute mean radiation protection quantities for a simulated x-ray spectrum with uncertainties using Monte Carlo techniques
- Based on **SpekPy:** Python package for modelling the x-ray spectra from x-ray tubes [▶ Go](#)

Main features of USpekPy

- Compute **mean values of radiation protection quantities** of a simulated x-ray spectrum: \overline{E} , K_{air} and $\overline{h_K}$
- Compute **mean radiation protection quantities** of a simulated x-ray spectrum **with uncertainties** using Monte Carlo techniques: first and second HVL for Al and Cu, \overline{E} , K_{air} and $\overline{h_K}$
- Perform **batch simulation** to compute mean values and uncertainties of radiation protection quantities for **several simulated x-ray spectra**

USpekPy in a nutshell

Status

Last version: 1.0.2
Release date: Jun 2024
Maintenance: Active

Links

Source code: [GitHub](#)
Documentation: [README @GitHub](#)
Contribute: [Issues @GitHub](#)

Testing

Tests: Passing
Code coverage: 65%

Authors

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Requirements

Python: ≥ 3.8
Dependencies: spekpy
pandas
openpyxl

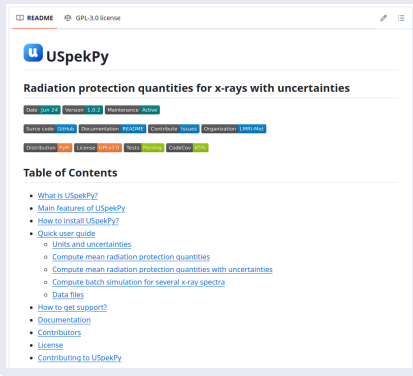
Distribution

Distribution: [PyPI](#)
License: [GNU GPL v3.0](#)

How to get support?

Package documentation

Check the [documentation](#) of
USpekPy at GitHub [► Go](#)



The screenshot shows the GitHub README for the USpekPy package. At the top, it says 'USpekPy' with a logo. Below that, it states 'Radiation protection quantities for x-rays with uncertainties'. There are badges for 'Date: Jan 24', 'Version: 1.0.2', and 'Maintenance: Active'. A row of links includes 'Source code', 'Documentation', 'README', 'Contribute', 'Issues', 'Organization', and 'Links'. Another row includes 'Distributions', 'PyPI', 'License', 'SPDX', 'Tests', 'Building', and 'Codecov'. A 'Table of Contents' section lists links for 'What is USpekPy?', 'Main features of USpekPy', 'How to install USpekPy?', 'Quick user guide' (with sub-links for 'Units and uncertainties', 'Compute mean radiation protection quantities', 'Compute mean radiation protection quantities with uncertainties', 'Compute batch simulation for several x-ray spectra', and 'Data files'), 'How to get support?', 'Documentation', 'Contributors', 'License', and 'Contributing to USpekPy'.

Contact developers

Contact the developers of
USpekPy [via email](#):

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How to contribute to USpekPy?

What may be a contribution?

- Bug reports & fixes
- Documentation improvements
- Feature enhancements

How to deliver a contribution?

- [Issues page](#) at GitHub (Recommended) [Go](#)
- Contact the developers [via email](#)

<input type="checkbox"/>	<input type="radio"/> 1 Open <input checked="" type="radio"/> 7 Closed	Author ▾	Label ▾	Projects ▾	Milestones ▾	Assignee ▾	Sort ▾
<input type="checkbox"/>	<input checked="" type="radio"/> Using the latest stable SciPy release (version 1.14.0) will cause USpekPy to crash bug						
	#9 opened yesterday by pazaviles						
<input type="checkbox"/>	<input checked="" type="radio"/> Value of kerma miscalculated bug						 1
	#8 by xandratxan was closed last week						
<input type="checkbox"/>	<input checked="" type="radio"/> Batch simulation can't process 4 or more simulation cases bug						 1
	#6 by xandratxan was closed 2 weeks ago						

What to include in a contribution?

- Title
- Description
- Steps to reproduce
- Minimal, reproducible example
- Environment
- Error messages and logs
- Potential fix

The screenshot shows a GitHub issue page for the pandas library. The issue title is "BUG: DataFrame to JSON failed when it with UUID #59132". The issue is labeled "BUG" and "Dataframe". It was opened by "grieve54706" 13 hours ago and has 1 comment. The issue is currently open and has 3 tasks done. The issue description includes a section for "Pandas version checks" with three checkboxes, all of which are checked. The "Reproducible Example" section contains a code block showing the following code:

```
import uuid
import pandas as pd

pd.DataFrame({"uuid": [uuid.uuid4()]}) .to_json()
```

The "Issue Description" section states: "If the DataFrame is with UUID, it will fail when to JSON. And raise the error with the message 'Unsupported UTF-8 sequence length when encoding string or UnicodeDecodeError: 'utf-8' codec can't decode byte 0xa1 in position 183: invalid start byte'." The "Expected Behavior" section states: "It should serialize 'uuid.UUID' instances to RFC 4122 format, e.g., 'f81d4fae-7dec-11d0-a765-00a0c91e6bf6'." The "Installed Versions" section is empty.