

USpekPy Package

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

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Wellcome to USpekPy!

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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](#)

[▶ Python usage poll](#)

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 says 'Radiation protection quantities for x-rays with uncertainties'. There are badges for 'Date: Jan 24', 'Version: 1.0.2', and 'Maintenance: Active'. Below these are links for 'Source code', 'Documentation', 'README', 'Contribute', 'Issues', 'Organization', and 'Links'. There are also badges for 'Distributions', 'License', 'Tests', 'Builds', and 'Codecov'. A 'Table of Contents' section lists the following items:

- [What is USpekPy?](#)
- [Main features of USpekPy](#)
- [How to install USpekPy?](#)
- [Quick user guide](#)
 - [Units and uncertainties](#)
 - [Compute mean radiation protection quantities](#)
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- [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"/>	1 Open ✓ 7 Closed	Author ▾	Label ▾	Projects ▾	Milestones ▾	Assignee ▾	Sort ▾
<input type="checkbox"/>	 Using the latest stable SciPy release (version 1.14.0) will cause USpekPy to crash bug #9 opened yesterday by pazaviles						
<input type="checkbox"/>	 Value of kerma miscalculated bug #8 by xandratxan was closed last week						 1
<input type="checkbox"/>	 Batch simulation can't proceses 4 or more simulation cases bug #6 by xandratxan was closed 2 weeks ago						 1

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 project 'USpekPy'. The issue title is 'BUG: DataFrame to JSON failed when it with UUID #59132'. It was opened by user 'grieve54706' 13 hours ago. The issue has 3 tasks done and 1 comment. The comment, also from 'grieve54706', includes a checklist for 'Pandas version checks' (all items checked), a 'Reproducible Example' with a code snippet, an 'Issue Description' of the error, 'Expected Behavior', and 'Installed Versions'.

ests 101 Actions Projects Security Insights

BUG: DataFrame to JSON failed when it with UUID #59132

Open 3 tasks done griev54706 opened this issue 13 hours ago · 1 comment

grieve54706 commented 13 hours ago · edited

Pandas version checks

- ☒ I have checked that this issue has not already been reported.
- ☒ I have confirmed this bug exists on the [latest version](#) of pandas.
- ☒ I have confirmed this bug exists on the [main branch](#) of pandas.

Reproducible Example

```
import uuid
import pandas as pd

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

Issue Description

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.`

Expected Behavior

It should serialize `uuid.UUID` instances to [RFC 4122](#) format, e.g., `f81d4fae-7dec-11d0-a765-00a0c91e6bf6`.

Installed Versions

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How to use USpekPy package?

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Conclusion

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- 4 **Conclusion**
 - Improvements on the horizon
 - Let us know what you think

Improvements on the horizon

- **Bug:** Fix SciPy dependency bug
- **New feature:** Add the contribution to the **uncertainty** of the variation of the mono-energetic air kerma-to-dose conversion coefficients
- **Documentation:** Improve package documentation (GitHub Wiki, GitHub Pages)
- **Testing:** Improve test code coverage

Let us know what you think

Complete our satisfaction survey about this seminar!

Help us make future seminars better.

► [Satisfaction survey](#)

Contribute to USpekPy package!

This software is for you. We want to make it fit better your necessities. Let us know if you find any issue or if you would like to have any new feature in future versions.

► [USpekPy Issues page](#)

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