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EXFOR/CINDA Dictionary in JSON

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Abstract

EXFOR/CINDA Dictionary in JSON provides the full information of the EXFOR/CINDA Dictionary in JSON (JavaScript Object Notation) format. It is designed for extraction of information from the EXFOR/CINDA Dictionary by a computer program.

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Introduction

The EXFOR/CINDA Dictionary describes various codes (e.g., `3ZZZIAE` for IAEA) used in the EXFOR and CINDA systems. The Dictionary consists of more than 40 dictionaries, and their contents and formats are summarized in the EXFOR/CINDA Dictionary Manual. The dictionary files used by the NRDC have fixed length formats designed for Fortran codes and not very suitable for some modern languages. The aim of the EXFOR/CINDA Dictionary in JSON is to support programmers and EXFOR end users who would like to extract information by such modern languages more efficiently.

How to use

Below is an example to obtain the expansion of the code `CUM,FY,,FRC` (fractional cumulative fission product yield) in Dictionary 236 (Quantities) from a JSON dictionary file (`dict_9130.json`) by using Python3:

```
$ python3
Python 3.9.9 (main, Jun 22 2022, 09:13:57)
>>> import json
>>> f=open("dict_9130.json")
>>> d=json.load(f)
>>> l=[x["expansion"] for x in d["236"] if x["code"]=="CUM,FY,,FRC"]
>>> print(l[0])
Fractional cumulative fission product yield
>>>
```

File contents

The EXFOR/CINDA Dictionary in JSON is a single plain text file. The general descriptions (e.g., transmission ID) are followed by Dictionary 1 (001), 2, (002), ... Below is an extraction from the JSON dictionary to show how the expansion of the code `CUM,FY,,FRC` is kept in the JSON Dictionary 236 (Quantities):

```
{
  "name": "EXFOR/CINDA Dictionary in JSON",
  "transmission_id": "9130",
  ...
  "236": [
    {
  ...
    },
    {
      "code": "CUM,FY,,FRC",
      "reaction_type_code": "FY",
      "unit_family_code": "NO",
      "resonance_flag": "",
      "expansion": "Fractional cumulative fission product yield",
      "long_expansion": "",
      "comment": [
        "Ratio of cumulative fission product yield",
        "to chain yield of fission product"
      ],
      ...
    },
  ...
```

Presence of keys (contents) depends on the dictionary, and it is summarized in Chapter 3 of the EXFOR/CINDA Dictionary Manual. In general, keys in the JSON dictionary (e.g., `code`, `reaction_type_code`) are also seen as the contents of the Archive Dictionary in the summary table of the manual (e.g., “code”, "reaction type code"). Below is an extraction from the Manual for Dictionary 236:

Dictionary 236: Quantities

Line	Contents	Format	Archive	…
1	Code	A30	13-42	…
	Reaction type code	A3	44-46	…
	Unit family code	A4	48-51	…
	Resonance flag . resonance parameter	A1	52	…
	Expansion	A71	53-123	…
	Flag 9 Expansion is given in the next line	I1	N/A	…
2+	Long expansion	A44	(44-87)	…
3+	Comment	A44	44-87	…

Note that

1. only lower cases are used in a key of the JSON dictionary.
2. underscore (_) is used in the JSON dictionary instead of a blank.

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