

# CanUVIT: A python package to check whether a field is safe for observations with UVIT

CanUVIT Python package can be installed using the following command.

```
$ pip install canuvit
```

After installation, CanUVIT can be run on a Python command prompt or as a script. For example, if the primary instrument is UVIT and the RA, DEC coordinates of the field is (12:12:12, 12:12:12) CanUVIT package can be run as follows.

```
>>> import canuvit
>>> canuvit.observe('uvit', '12:12:12', '12:12:12')
```

The general format is `canuvit.observe(instrument, RA, DEC)` where *instrument* can be either 'uvit', 'sxt', 'czt1', or 'laxpc' and RA and DEC coordinates need to be in sexagesimal format.

For the above example, the output as given below is obtained. Please also check the working directory for the output GALEX images with sources marked in the primary instrument field of view.

```
### VIS
```

ra_hms	dec_dms	mag	B-V	SpecType	VIS3	VIS2	VIS1	ND1	BK7
12:11:52.7568	+12:07:47.532	11.096	0.864	K1	1333.0	124.4	88.6	29.7	1624.9
12:12:22.944	+12:17:23.856	11.126	0.814	K0	1296.7	121.0	86.2	28.9	1580.6
12:11:35.016	+12:12:04.644	11.426	0.451	F5	1457.4	234.9	180.9	32.8	1915.2
12:11:01.656	+12:08:35.916	11.874	0.694	G5	754.3	89.1	69.2	16.8	950.9
12:11:11.5272	+12:03:14.04	12.177	0.322	F0	803.1	143.5	101.4	18.2	1061.7
12:12:05.5368	+12:19:09.768	12.268	0.787	K0	452.9	42.3	30.1	10.1	552.1

```
Safe filters: ['VIS3', 'VIS2', 'VIS1', 'ND1', 'BK7']
```

```
FUV observations seem to be absent! Using M_fuv = M_nuv - 1.65.
```

```
### NUV
```

sl_no	ra_hms	dec_dms	Mag	Mag_corrected	silica	b4	b13	b15	n2
1	12:12:32.3946	+12:07:27.4144	19.32	19.32	1.86	0.41	0.50	0.14	0.10
2	12:11:11.6503	+12:03:14.7794	16.25	16.25	31.75	6.99	8.57	2.35	1.75
3	12:12:41.0882	+12:14:58.2679	16.15	16.15	34.66	7.63	9.36	2.56	1.91
4	12:12:15.3493	+12:29:18.1277	19.50	19.50	1.59	0.35	0.43	0.12	0.09
5	12:11:35.0116	+12:12:04.7063	16.47	16.47	25.93	5.70	7.00	1.92	1.43

```
Safe filters in NUV: ['Silica', 'NUV-grating', 'NUV-B4', 'NUV-B13', 'NUV-B15', 'NUV-N2']
```

```
### FUV
```

sl_no	ra_hms	dec_dms	Mag	Mag_corrected	caf2	baf2	sapphire	silica
1	12:12:32.3946	+12:07:27.4144	19.32	17.67	1.65	1.40	1.04	0.36
2	12:11:11.6503	+12:03:14.7794	16.25	14.60	28.17	23.94	17.75	6.20
3	12:12:41.0882	+12:14:58.2679	16.15	14.50	30.75	26.14	19.37	6.76
4	12:12:15.3493	+12:29:18.1277	19.50	17.85	1.41	1.20	0.89	0.31
5	12:11:35.0116	+12:12:04.7063	16.47	14.82	23.00	19.55	14.49	5.06

```
Safe filters in FUV: ['CaF2', 'FUV-grating', 'BaF2', 'Sapphire', 'Silica']
```

Two additional functions are also available which takes the same input arguments as `canuvit.observe()`.

- `canuvit.observe_VIS()`: to find safe VIS filters.
- `canuvit.observe_UV()`: to find safe UV filters.

### Command Line Interface

After installation with `pip`, CanUVIT can also be accessed from the command line. An example is given below

```
$ canuvit -i uvit -r "12:12:12" -d "12:12:12"
```

The help page of the command line tool can be accessed as follows:

```
$ canuvit -h
```

```
Usage: canuvit [OPTIONS]
```

```
Program to check if a given coordinate can be safely observed using UVIT.
```

```
Example usage:
```

```
canuvit -r "13:12:14" -d "-14:15:13"
```

```
Options:
```

```
--all                Check safety for all filters. [default:
                    all]
--vis                Check safety for only visible filters.
--uv                Check safety for only UV filters.
-r, --ra RA          Right ascension of the coordinate. Format:
                    hh:mm:ss[.ss] e.g. "00:54:53.45" [required]
-d, --dec DEC        Declination of the coordinate. Format:
                    [-]dd:mm:ss[.ss] e.g. "-37:41:03.23".
                    [required]
-i, --instrument [uvit|sxt|czti|laxpc]
                    Instrument to check for. [default: uvit]
-v, --verbose        Increase output verbosity.
--version            Show the version and exit.
-h, --help           Show this message and exit.
```

CanUVIT is an open source. The source code is available at <https://github.com/prajwel/canuvit>.