



asdf_{unit_schemas}Documentation

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The ASDF Unit Schemas define a set of schemas for serializing the units defined by [astropy.units](#) for the ASDF file format. These schemas are based upon the schemas in the [ASDF Standard](#) and are packaged for use by the [ASDF](#) library.

Note: This is only a schema package, to use these schemas to serialize astropy units, one must install the [asdf-astropy](#) package.

Part I

Included Resources

The following are listings of all the schemas provided by this package for ASDF.

Note: Typically, schemas are used in ASDF via their tag, which can be found in the manifest. Using a transform in ASDF it is recommended that you use the tag instead of a direct reference to the schema. When doing so make sure you are using the correct manifest version.

UNIT SCHEMAS

The current unit schemas:

1.1 defunit-1.0.0

Define a new physical unit.

Description

Defines a new unit. It can be used to either:

- Define a new base unit.
- Create a new unit name that is equivalent to a given unit.

The new unit must be defined before any unit tags that use it.

Outline

Schema Definitions

Original Schema

Schema Definitions

This type is an object with the following properties:

name

The name of the new unit. *No length restriction*

Must match the following pattern:

```
[A-Za-z_][A-Za-z0-9_]+
```

unit

The unit that the new name is equivalent to. It is optional, and if not provided, or null, this defunit defines a new base unit.

This node must validate against **any** of the following:

– unit-1.0.0

–

null

Original Schema

```
%YAML 1.1
---
$schema: "http://stsci.edu/schemas/yaml-schema/draft-01"
id: "http://stsci.edu/schemas/asdf/unit/defunit-1.0.0"
title: Define a new physical unit.
description: |
  Defines a new unit. It can be used to either:

  - Define a new base unit.

  - Create a new unit name that is equivalent to a given unit.

  The new unit must be defined before any unit tags that use it.

type: object
properties:
  name:
    description: The name of the new unit.
    type: string
    pattern: "[A-Za-z_][A-Za-z0-9_]+"

  unit:
    description: |
      The unit that the new name is equivalent to. It is optional,
      and if not provided, or ``null``, this ``defunit`` defines a new
      base unit.

    anyOf:
      - $ref: "unit-1.0.0"
      - type: "null"

required: [name]
...
```

1.2 quantity-1.1.0

Represents a Quantity object from astropy

Description

A Quantity object represents a value that has some unit associated with the number.

Outline

Schema Definitions

Examples

Original Schema

Schema Definitions

This type is an object with the following properties:

- value

A vector of one or more values

This node must validate against **any** of the following:

-
- number
- `../core/ndarray-1.0.0`
- unit

The unit corresponding to the values

Examples

A quantity consisting of a scalar value and unit:

```
!unit/quantity-1.1.0
value: 3.14159
unit: km
```

A quantity consisting of a single value in an array:

```
!unit/quantity-1.1.0
value: !core/ndarray-1.0.0 [2.71828]
unit: A
```

A quantity with an array of values:

```
!unit/quantity-1.1.0
value: !core/ndarray-1.0.0 [1, 2, 3, 4]
unit: s
```

A quantity with an n-dimensional array of values:

```
!unit/quantity-1.1.0
value: !core/ndarray-1.0.0
  datatype: float64
  data: [[1, 2, 3],
         [4, 5, 6]]
unit: pc
```

Original Schema

```
%YAML 1.1
---
$schema: "http://stsci.edu/schemas/yaml-schema/draft-01"
id: "http://stsci.edu/schemas/asdf/unit/quantity-1.1.0"

title: >
  Represents a Quantity object from astropy
description: |
  A Quantity object represents a value that has some unit
  associated with the number.

examples:
  -
```

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```

- A quantity consisting of a scalar value and unit
- |
  !unit/quantity-1.1.0
  value: 3.14159
  unit: km

-
- A quantity consisting of a single value in an array
- |
  !unit/quantity-1.1.0
  value: !core/ndarray-1.0.0 [2.71828]
  unit: A

-
- A quantity with an array of values
- |
  !unit/quantity-1.1.0
  value: !core/ndarray-1.0.0 [1, 2, 3, 4]
  unit: s

-
- A quantity with an n-dimensional array of values
- |
  !unit/quantity-1.1.0
  value: !core/ndarray-1.0.0
  datatype: float64
  data: [[1, 2, 3],
         [4, 5, 6]]
  unit: pc

type: object
properties:
  value:
    description: |
      A vector of one or more values
    anyOf:
      - type: number
      - $ref: "../core/ndarray-1.0.0"
    unit:
      description: |
        The unit corresponding to the values
      $ref: unit-1.0.0
  required: [value, unit]
  ...

```

1.3 unit-1.0.0

Physical unit.

Description

This represents a physical unit, in VOUnit syntax, Version 1.0. Where units are not explicitly tagged, they are assumed to be in VOUnit syntax.

Outline

Schema Definitions

Examples

Original Schema

Schema Definitions

string *No length restriction*

Must match the following pattern:

```
[-]*
```

Examples

Example unit:

```
!unit/unit-1.0.0 "2.1798721 10-18kg m2 s-2"
```

Original Schema

```
%YAML 1.1
---
$schema: "http://stsci.edu/schemas/yaml-schema/draft-01"
id: "http://stsci.edu/schemas/asdf/unit/unit-1.0.0"
title: Physical unit.
description: >
  This represents a physical unit, in [VOUnit syntax, Version
  1.0](http://www.ivoa.net/documents/VOUnits/index.html).

  Where units are not explicitly tagged, they are assumed to be
  in VOUnit syntax.
examples:
-
  - Example unit
  - |
    !unit/unit-1.0.0 "2.1798721 10-18kg m2 s-2"

type: string
pattern: "[\x00-\x7f]*"
...
```


LEGACY UNIT SCHEMAS

The legacy unit schemas:

MANIFESTS

The ASDF tags (described by schemas) available under each ASDF unit schemas version are all described by a single manifest document for that version.

3.1 unit-1.0.0

Unit extension 1.0.0

Description

A set of tags for serializing units.

Outline

Schema Definitions

Original Schema

Schema Definitions *This node has no type definition (unrestricted)*

Original Schema

```
id: asdf://asdf-format.org/unit/manifests/unit-1.0.0
extension_uri: asdf://asdf-format.org/unit/extensions/unit-1.0.0
title: Unit extension 1.0.0
description: |-
  A set of tags for serializing units.
tags:
- tag_uri: tag:stsci.edu:asdf/unit/defunit-1.0.0
  schema_uri: http://stsci.edu/schemas/asdf/unit/defunit-1.0.0
  title: Define a new physical unit.
  description: |-
    Defines a new unit. It can be used to either:

    - Define a new base unit.

    - Create a new unit name that is a equivalent to a given unit.

    The new unit must be defined before any unit tags that use it.
- tag_uri: tag:stsci.edu:asdf/unit/unit-1.0.0
  schema_uri: http://stsci.edu/schemas/asdf/unit/unit-1.0.0
  title: Physical unit.
  description: |-
```

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This represents a physical unit, in [VOUnit syntax, Version 1.0](<http://www.ivoa.net/documents/VOUnits/index.html>).
 ↪ documents/VOUnits/index.html).
 Where units are not explicitly tagged, they are assumed to be in VUnit syntax.

3.2 unit-1.1.0

Unit extension 1.1.0

Description

A set of tags for serializing units.

Outline

Schema Definitions

Original Schema

Schema Definitions *This node has no type definition (unrestricted)*

Original Schema

```

id: asdf://asdf-format.org/unit/manifests/unit-1.1.0
extension_uri: asdf://asdf-format.org/unit/extensions/unit-1.1.0
title: Unit extension 1.1.0
description: |-
  A set of tags for serializing units.
tags:
- tag_uri: tag:stsci.edu:asdf/unit/defunit-1.0.0
  schema_uri: http://stsci.edu/schemas/asdf/unit/defunit-1.0.0
  title: Define a new physical unit.
  description: |-
    Defines a new unit. It can be used to either:

    - Define a new base unit.

    - Create a new unit name that is a equivalent to a given unit.

    The new unit must be defined before any unit tags that use it.
- tag_uri: tag:stsci.edu:asdf/unit/quantity-1.1.0
  schema_uri: http://stsci.edu/schemas/asdf/unit/quantity-1.1.0
  title: Represents a Quantity object from astropy
  description: |-
    A Quantity object represents a value that has some unit
    associated with the number.
- tag_uri: tag:stsci.edu:asdf/unit/unit-1.0.0
  schema_uri: http://stsci.edu/schemas/asdf/unit/unit-1.0.0
  title: Physical unit.
  description: |-
    This represents a physical unit, in [VOUnit syntax, Version 1.0](http://www.ivoa.net/
    ↪ documents/VOUnits/index.html).
    Where units are not explicitly tagged, they are assumed to be in VUnit syntax.
    
```

Part II

Developer Resources

CONTRIBUTING

We welcome feedback and contributions of all kinds. Contributions of code, documentation, or general feedback are all appreciated.

4.1 Reporting Issues

Feature requests and bug reports for the Python implementation can be posted at [asdf-unit-schemas's github page](#).

4.2 Contributing Code and Documentation

We love contributions! If you're interested in contributing to this project, please open a Pull Request or issue and we would be glad to work with you.

Note: ASDF-unit-schemas is mostly a collection of schemas for the ASDF format. This means that in addition to contributing a schema, you will likely also need some code to actually handle serializing and deserializing your data. Typically, this code will need to be contributed to [asdf-astropy](#), which is a separate project. Please link your pull requests and issues between the two projects.

CHANGE LOG

5.1 0.1.1 (Unreleased)

- Remove duplicate unit manifests [#5]
- Increase setuptools version [#6]

5.2 0.1.0 (2022-10-11)

- Initial release

Part III

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