nemo-fits-extension

A Nemo extension for viewing FITS (Flexible Image Transport System) file metadata.

Description

nemo-fits-extension provides integration with Nemo (the Cinnamon file manager) for FITS files, which are commonly used in astronomy and scientific imaging. The extension adds an "Image" tab to the file properties dialog displaying detailed FITS header information.

Features

- **Properties Tab**: Displays detailed FITS header information in the file properties dialog:
  - Image dimensions (width × height, or higher dimensional data)
  - Data type (BITPIX: 8/16/32/64-bit integer or 32/64-bit floating point)
  - Object name
  - Telescope and instrument information
  - Observer name
  - Date of observation
  - Exposure time
  - Filter used
  - Coordinate system (equinox, RA, DEC)

Dependencies

Build Dependencies

- `meson` (>= 0.56.0)
- `libglib2.0-dev` (>= 2.50.0)
- `libgtk-3-dev` (>= 3.22.0)
- `libnemo-extension-dev` (>= 3.0.0)
- `libcfitsio-dev` (>= 3.0)
- `gettext`
- `intltool`

Runtime Dependencies

- `nemo` (>= 3.0.0)
- `libcfitsio9` or `libcfitsio10`

Installation

Building from Source

```bash
# Install build dependencies (Debian/Ubuntu)
sudo apt install meson libglib2.0-dev libgtk-3-dev libnemo-extension-dev \
                 libcfitsio-dev gettext intltool

# Build
cd nemo-fits-extension
meson setup build
meson compile -C build

# Install
sudo meson install -C build
```

Debian/Ubuntu Package

```bash
cd nemo-fits-extension
dpkg-buildpackage -us -uc -b
sudo dpkg -i ../nemo-fits-extension_*.deb
```

After installation, restart Nemo:

```bash
nemo -q
```

File Structure

```
nemo-fits-extension/
├── nemo-fits-extension.c     # Main extension implementation
├── nemo-fits-extension.h     # Header file
├── meson.build               # Meson build configuration
├── po/                       # Translations
│   ├── meson.build
│   └── POTFILES
├── debian/                   # Debian packaging
│   ├── control
│   ├── changelog
│   ├── rules
│   ├── compat
│   └── install
└── README.md                 # This file
```

Supported File Extensions

- `.fits` - Standard FITS extension
- `.fit` - Alternative FITS extension
- `.fts` - Alternative FITS extension

FITS Header Keywords

The extension recognizes and displays the following standard FITS keywords:

Required Keywords

- `NAXIS`, `NAXIS1`, `NAXIS2`, ... - Array dimensions
- `BITPIX` - Data type

Optional Keywords

- `OBJECT` - Object being imaged
- `TELESCOP` - Telescope name
- `INSTRUME` - Instrument name
- `OBSERVER` - Observer name
- `DATE-OBS` - Date of observation
- `EXPTIME` - Exposure time in seconds
- `FILTER` - Filter used
- `EQUINOX` - Coordinate system equinox
- `RA` / `CRVAL1` - Right Ascension
- `DEC` / `CRVAL2` - Declination

Technical Details

The extension is implemented in C following the same architecture as other C-based nemo-extensions (like nemo-image-converter):

1. **NemoPropertyPageProvider**: Adds the Image tab to the properties dialog
2. **NemoInfoProvider**: Can be extended to add file attributes
3. **NemoNameAndDescProvider**: Provides extension name and description
4. **CFITSIO Library**: Used for robust FITS file reading

The extension is compiled as a shared module that Nemo loads dynamically at runtime.

Troubleshooting

Extension not appearing

1. Ensure the extension is installed: `ls /usr/lib/nemo/extensions-3.0/`
2. Check for libnemo-fits-extension.so
3. Restart Nemo: `nemo -q`
4. Check for errors: `nemo --debug` or look in `~/.xsession-errors`

Build errors

If you encounter CFITSIO-related errors:

```bash
# Check if CFITSIO is installed
pkg-config --modversion cfitsio

# On Debian/Ubuntu
sudo apt install libcfitsio-dev

# On Fedora
sudo dnf install cfitsio-devel

# On Arch
sudo pacman -S cfitsio
```

License

GPL-2.0-or-later

Author

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References

- FITS Standard
- CFITSIO Library
- Nemo Extensions Repository
- Nemo Extension API