WIEN2k 24.1 Install with OneAPI (ifx)

November 8, 2025

Linux Operating System Version (lsb_release -a): Fedora Linux 42 (Workstation Edition)
Fortran Compiler Version (ifx -v): ifx version 2025.3.0
WIEN2k Version (cat $WIENROOT/WIEN2k_VERSION): 24.1 (Release 1/8/2024)

The Fedora 42 was already installed, but if that is needed it should be available at:

https://dl.fedoraproject.org/pub/fedora/linux/releases/42/Workstation/x86_64/iso/

Operating system packages needed were installed before proceeding with step 1 given below. If that hasn't been done, then install them:

```
username@fedora:~$ sudo yum update
…
username@fedora:~$ sudo yum install lsb_release tcsh make autoconf libtool
…
username@fedora:~$ sudo yum install gnuplot gedit patch openbabel mesa-libGL-devel
…
username@fedora:~$ sudo yum install mesa-libGLU-devel tcl8-devel tk8-devel
…
username@fedora:~$ sudo yum install fftw-devel libXmu-devel gfortran perl
...
```

Note: If prompted with "Is this ok [y/N]", enter: y.

Togl 2.0 was installed following
https://mailman.ijs.si/pipermail/xcrysden/2024-September/002152.html :

```
username@fedora:~$ wget https://sourceforge.net/projects/togl/files/Togl/2.0/Togl2.0-src.tar.gz/download
...
username@fedora:~$ tar xvf download
...
username@fedora:~$ cd Togl2.0/
username@fedora:~/Togl2.0$  ./configure --with-tcl=/usr/lib64 --with-tk=/usr/lib64 --enable-64bit
...
username@fedora:~/Togl2.0$ wget https://raw.githubusercontent.com/gsabo/xcrysden-Patches/main/togl.patch
...
username@fedora:~/Togl2.0$ patch -b togl.c togl.patch
username@fedora:~/Togl2.0$ make
username@fedora:~/Togl2.0$ ln -s libTogl2.0.so libTogl.so.2
```

The XCrySDen 1.6.2 was installed using:

username@fedora:~/Togl2.0$ cd ..
username@fedora:~$ wget http://www.xcrysden.org/download/xcrysden-1.6.2-linux_x86_64-shared.tar.gz
...
username@fedora:~$ tar xvf xcrysden-1.6.2-linux_x86_64-shared.tar.gz
username@fedora:~ $ gedit ~/.bashrc
…
export XCRYSDEN_TOPDIR=$HOME/xcrysden-1.6.2-bin-shared
export PATH=$PATH:$XCRYSDEN_TOPDIR
export LD_LIBRARY_PATH=$LD_LIBRARY_PATH:$HOME/Togl2.0

username@fedora:~ $ source ~/.bashrc

Of note, for XCrySDen to work with Wayland, toglOpt(accum) needs set to false in the /home/username/xcrysden-1.6.2-bin-shared/Tcl/custom-definitions file:

https://www.mail-archive.com/wien@zeus.theochem.tuwien.ac.at/msg23440.html

Restart the computer.

Installed OneAPI [https://www.intel.com/content/www/us/en/docs/oneapi/installation-guide-linux/2025-2/hpc-yum-dnf.html#HPC-YUM-DNF] using:

username@fedora:~$ tee > /tmp/oneAPI.repo << EOF
[oneAPI]
name=Intel® oneAPI repository
baseurl=https://yum.repos.intel.com/oneapi
enabled=1
gpgcheck=1
repo_gpgcheck=1
gpgkey=https://yum.repos.intel.com/intel-gpg-keys/GPG-PUB-KEY-INTEL-SW-PRODUCTS.PUB
EOF

…

username@fedora:~$ sudo mv /tmp/oneAPI.repo /etc/yum.repos.d
username@fedora:~$ sudo yum install intel-hpckit
...
Is this ok [y/N]: y

…

Is this ok [y/N]: y
...

Is this ok [y/N]: y
…

The key was successfully imported.
[1/87] Verify package files 100% | 16.0 B/s | 85.0 B | 00m05s
[2/87] Prepare transaction 100% | 226.0 B/s | 85.0 B | 00m00s
[3/87] Installing intel-oneapi-common- 100% | 4.0 MiB/s | 110.2 KiB | 00m00s
[4/87] Installing intel-oneapi-common- 100% | 1.8 MiB/s | 25.5 KiB | 00m00s
[5/87] Installing intel-oneapi-common- 100% | 13.7 MiB/s | 42.2 KiB | 00m00s
[6/87] Installing intel-oneapi-mpi-202 100% | 87.7 MiB/s | 117.2 MiB | 00m01s
[7/87] Installing intel-oneapi-mkl-cla 100% | 148.7 MiB/s | 18.1 MiB | 00m00s
[8/87] Installing intel-oneapi-compile 100% | 104.5 MiB/s | 335.1 MiB | 00m03s
[9/87] Installing intel-oneapi-mpi-dev 100% | 124.5 MiB/s | 397.0 MiB | 00m03s
[10/87] Installing intel-oneapi-libdpst 100% | 42.2 MiB/s | 3.0 MiB | 00m00s
[11/87] Installing intel-oneapi-tcm-1.4 100% | 68.6 MiB/s | 3.4 MiB | 00m00s
[12/87] Installing intel-oneapi-tbb-202 100% | 70.3 MiB/s | 4.5 MiB | 00m00s
[13/87] Installing intel-oneapi-tbb-dev 100% | 62.6 MiB/s | 7.5 MiB | 00m00s
[14/87] Installing intel-oneapi-umf-1.0 100% | 12.4 MiB/s | 430.4 KiB | 00m00s
[15/87] Installing intel-oneapi-tlt-202 100% | 19.9 MiB/s | 407.0 KiB | 00m00s
[16/87] Installing intel-oneapi-hpc-too 100% | 1.1 MiB/s | 5.5 KiB | 00m00s
[17/87] Installing intel-oneapi-tlt-0:2 100% | 121.1 KiB/s | 124.0 B | 00m00s
[18/87] Installing intel-oneapi-tbb-dev 100% | 8.1 KiB/s | 124.0 B | 00m00s
[19/87] Installing intel-oneapi-mpi-dev 100% | 60.5 KiB/s | 124.0 B | 00m00s
[20/87] Installing intel-oneapi-compile 100% | 68.5 MiB/s | 631.2 KiB | 00m00s
[21/87] Installing intel-oneapi-mkl-syc 100% | 64.5 MiB/s | 2.2 MiB | 00m00s
[22/87] Installing intel-oneapi-ishmem- 100% | 141.5 MiB/s | 28.2 MiB | 00m00s
[23/87] Installing intel-oneapi-ishmem- 100% | 23.0 MiB/s | 542.4 KiB | 00m00s
[24/87] Installing intel-oneapi-ishmem- 100% | 13.5 KiB/s | 124.0 B | 00m00s
[25/87] Installing intel-oneapi-ccl-202 100% | 176.0 MiB/s | 348.2 MiB | 00m02s
[26/87] Installing intel-oneapi-ccl-dev 100% | 191.6 MiB/s | 339.0 MiB | 00m02s
[27/87] Installing intel-oneapi-ccl-dev 100% | 9.3 KiB/s | 124.0 B | 00m00s
[28/87] Installing intel-oneapi-vtune-0 100% | 24.9 MiB/s | 1.4 GiB | 00m00s
>>> Running %post scriptlet: intel-oneapi-vtune-0:2025.7.0-246.x86_64
>>> Finished %post scriptlet: intel-oneapi-vtune-0:2025.7.0-246.x86_64
>>> Scriptlet output:
>>> C compiler version: 15.2.1
>>> Make version: 4.4.1
[28/87] Installing intel-oneapi-vtune-0 100% | 94.2 MiB/s | 1.4 GiB | 00m16s
>>> Running %post scriptlet: intel-oneapi-vtune-0:2025.7.0-246.x86_64
>>> Finished %post scriptlet: intel-oneapi-vtune-0:2025.7.0-246.x86_64
>>> Scriptlet output:

```
>>> C compiler version: 15.2.1
>>> Make version: 4.4.1
>>>
>>> ERROR: kernel source directory "/usr/src/linux-6.17.7-200.fc42.x86_64" eithe
>>>
>>> Please use the following command to install kernel header on Fedora:
>>>      dnf install kernel-devel-6.17.7-200.fc42.x86_64
>>>
>>> Configuring sep5 boot script with the following options:
>>>     driver files = /opt/intel/oneapi/vtune/2025.7/sepdk/src/.
>>> Creating systemd load script /usr/local/sbin/sep5-load.sh ...
>>> done.
>>> Creating systemd boot config file /usr/lib/systemd/system/sep5.service ...
>>> done.
>>> Configuring autoload of sep5.service service ...
>>> Created symlink '/etc/systemd/system/multi-user.target.wants/sep5.service' →
>>> Job for sep5.service failed because the control process exited with error co
>>> See "systemctl status sep5.service" and "journalctl -xeu sep5.service" for d
>>> WARNING: systemctl start returned error 1 ...
>>> ============================================================
>>> sep5.service failed to start.
>>> This can be due to SELinux is enforced on this system.
>>> Please disable SELinux to install sep5.service
>>> ============================================================
>>> done.
>>>
[29/87] Installing intel-oneapi-advisor 100% |  95.9 MiB/s | 825.1 MiB |  00m09s
[30/87] Installing intel-oneapi-dpcpp-c 100% | 115.0 KiB/s |   2.1 KiB |  00m00s
[31/87] Installing intel-oneapi-dpcpp-c 100% |  99.5 MiB/s | 218.0 MiB |  00m02s
[32/87] Installing intel-oneapi-dpcpp-c 100% | 121.1 KiB/s | 124.0   B |  00m00s
[33/87] Installing intel-oneapi-dev-uti 100% | 128.7 KiB/s |   2.2 KiB |  00m00s
[34/87] Installing intel-oneapi-dev-uti 100% | 111.0 MiB/s |  19.4 MiB |  00m00s
[35/87] Installing intel-oneapi-dev-uti 100% |  60.5 KiB/s | 124.0   B |  00m00s
[36/87] Installing intel-oneapi-openmp- 100% |   3.1 MiB/s |  63.1 KiB |  00m00s
[37/87] Installing intel-oneapi-openmp- 100% | 112.7 MiB/s | 487.5 MiB |  00m04s
[38/87] Installing intel-oneapi-mkl-cor 100% | 107.5 MiB/s | 535.3 MiB |  00m05s
[39/87] Installing intel-oneapi-mkl-cor 100% | 130.3 MiB/s | 796.8 MiB |  00m06s
[40/87] Installing intel-oneapi-compile 100% | 108.4 MiB/s | 475.9 MiB |  00m04s
[41/87] Installing intel-oneapi-compile 100% | 104.7 MiB/s | 338.3 MiB |  00m03s
[42/87] Installing intel-oneapi-mkl-syc 100% |  91.0 MiB/s |  77.9 MiB |  00m01s
[43/87] Installing intel-oneapi-mkl-syc 100% | 121.7 MiB/s |  33.8 MiB |  00m00s
[44/87] Installing intel-oneapi-mkl-syc 100% | 117.0 MiB/s |  75.2 MiB |  00m01s
[45/87] Installing intel-oneapi-dnnl-20 100% | 121.8 MiB/s | 103.1 MiB |  00m01s
[46/87] Installing intel-oneapi-dnnl-de 100% |  43.3 MiB/s |   1.8 MiB |  00m00s
[47/87] Installing intel-oneapi-dnnl-de 100% |  12.1 KiB/s | 124.0   B |  00m00s
```

```
[48/87] Installing intel-oneapi-dal-202 100% | 131.8 MiB/s | 417.3 MiB |  00m03s
[49/87] Installing intel-oneapi-mkl-syc 100% | 121.8 MiB/s |   7.9 MiB |  00m00s
[50/87] Installing intel-oneapi-mkl-syc 100% | 166.3 MiB/s |  35.4 MiB |  00m00s
[51/87] Installing intel-oneapi-mkl-syc 100% | 119.1 MiB/s |  81.3 MiB |  00m01s
[52/87] Installing intel-oneapi-mkl-syc 100% | 107.6 MiB/s |  18.8 MiB |  00m00s
[53/87] Installing intel-oneapi-mkl-syc 100% |  94.7 MiB/s | 101.6 MiB |  00m01s
[54/87] Installing intel-oneapi-mkl-syc 100% | 730.5 KiB/s |   1.5 KiB |  00m00s
[55/87] Installing intel-oneapi-mkl-syc 100% | 158.3 MiB/s | 934.7 MiB |  00m06s
[56/87] Installing intel-oneapi-compile 100% |  91.7 MiB/s |   2.7 MiB |  00m00s
[57/87] Installing intel-oneapi-mkl-clu 100% |  91.3 MiB/s |  16.3 MiB |  00m00s
[58/87] Installing intel-oneapi-mkl-clu 100% | 119.4 MiB/s |  28.7 MiB |  00m00s
[59/87] Installing intel-oneapi-mkl-cla 100% | 121.1 KiB/s | 124.0   B |  00m00s
[60/87] Installing intel-oneapi-mkl-dev 100% | 121.1 KiB/s | 124.0   B |  00m00s
[61/87] Installing intel-oneapi-mkl-dev 100% |  10.1 KiB/s | 124.0   B |  00m00s
[62/87] Installing intel-oneapi-dal-dev 100% | 142.0 MiB/s |   1.0 GiB |  00m07s
[63/87] Installing intel-oneapi-dal-dev 100% |  12.1 KiB/s | 124.0   B |  00m00s
[64/87] Installing intel-oneapi-ipp-202 100% | 101.4 MiB/s | 213.0 MiB |  00m02s
[65/87] Installing intel-oneapi-ipp-dev 100% | 127.2 MiB/s | 553.0 MiB |  00m04s
[66/87] Installing intel-oneapi-ipp-dev 100% |  40.4 KiB/s | 124.0   B |  00m00s
[67/87] Installing intel-oneapi-dpcpp-d 100% | 115.9 MiB/s | 294.0 MiB |  00m03s
[68/87] Installing intel-oneapi-compile 100% | 135.1 MiB/s | 114.5 MiB |  00m01s
[69/87] Installing intel-oneapi-compile 100% | 125.0 MiB/s | 201.1 MiB |  00m02s
[70/87] Installing intel-oneapi-compile 100% | 123.2 KiB/s |   2.1 KiB |  00m00s
[71/87] Installing intel-oneapi-compile 100% | 132.1 KiB/s |   2.1 KiB |  00m00s
[72/87] Installing intel-oneapi-icc-ecl 100% |  40.4 KiB/s | 124.0   B |  00m00s
[73/87] Installing intel-oneapi-compile 100% |  77.6 MiB/s |  16.2 MiB |  00m00s
[74/87] Installing intel-oneapi-common- 100% | 121.1 KiB/s | 124.0   B |  00m00s
[75/87] Installing intel-oneapi-common- 100% |  40.4 KiB/s | 124.0   B |  00m00s
[76/87] Installing libstdc++-devel-0:15 100% | 141.1 MiB/s |  16.2 MiB |  00m00s
[77/87] Installing gcc-c++-0:15.2.1-3.f 100% | 320.7 MiB/s |  41.4 MiB |  00m00s
[78/87] Installing intel-oneapi-dpcpp-c 100% | 105.2 MiB/s | 867.7 MiB |  00m08s
[79/87] Installing intel-oneapi-compile 100% | 121.1 KiB/s | 124.0   B |  00m00s
[80/87] Installing intel-oneapi-compile 100% |  17.3 KiB/s | 124.0   B |  00m00s
[81/87] Installing openssl-devel-1:3.2. 100% |  10.0 MiB/s |   5.2 MiB |  00m01s
[82/87] Installing intel-oneapi-ippcp-2 100% |  69.5 MiB/s |  11.3 MiB |  00m00s
[83/87] Installing intel-oneapi-ippcp-d 100% | 122.6 MiB/s |  36.9 MiB |  00m00s
[84/87] Installing intel-oneapi-ippcp-d 100% | 121.1 KiB/s | 124.0   B |  00m00s
[85/87] Installing intel-oneapi-hpc-too 100% | 432.6 KiB/s |   6.9 KiB |  00m00s
[86/87] Installing intel-oneapi-hpc-too 100% |  12.1 KiB/s | 124.0   B |  00m00s
[87/87] Installing intel-hpckit-0:2025. 100% |  10.0   B/s | 124.0   B |  00m12s
Complete!
username@fedora:~$ echo "source /opt/intel/oneapi/setvars.sh intel64" >> ~/.bashrc
username@fedora:~$ grep oneapi ~/.bashrc
source /opt/intel/oneapi/setvars.sh intel64
username@fedora:~$ source ~/.bashrc
```

```
:: initializing oneAPI environment ...
   bash: BASH_VERSION = 5.2.21(1)-release
   args: Using "$@" for setvars.sh arguments: intel64
:: advisor -- latest
:: ccl -- latestusername@fedora:~$ source ~/.bashrc

:: initializing oneAPI environment ...
   bash: BASH_VERSION = 5.2.37(1)-release
   args: Using "$@" for setvars.sh arguments: intel64
:: advisor -- latest
:: ccl -- latest
:: compiler -- latest
:: dal -- latest
:: debugger -- latest
:: dev-utilities -- latest
:: dnnl -- latest
:: dpcpp-ct -- latest
:: dpl -- latest
:: ipp -- latest
:: ippcp -- latest
:: ishmem -- latest
:: mkl -- latest
:: mpi -- latest
:: tbb -- latest
:: umf -- latest
:: vtune -- latest
:: oneAPI environment initialized ::
username@fedora:~$ ifx -v
ifx version 2025.3.0
username@fedora:~$ icx -v
Intel(R) oneAPI DPC++/C++ Compiler 2025.3.1 (2025.3.1.20251023)
...
username@fedora:~$ mpiifx -v
...
ifx version 2025.3.0
```

1. The following was entered into the terminal to install libxc:

```
username@fedora:~$ cd ~
username@fedora:~$ wget https://gitlab.com/libxc/libxc/-/archive/7.0.0/libxc-7.0.0.tar.bz2
...
username@fedora:~$ tar xvf libxc-7.0.0.tar.bz2
...
username@fedora:~$ cd libxc-7.0.0/
```

```
username@cfedora:~/libxc-7.0.0$ autoreconf -i --force
...
username@fedora:~/libxc-7.0.0$ ./configure FC=ifx CC=icx --prefix=$HOME/libxc-7.0.0
...
username@fedora:~/libxc-7.0.0$ make
...
username@fedora:~/libxc-7.0.0$ make check
...
PASS: xc-run_testsuite
============================================================================
=======
Testsuite summary for libxc 7.0.0
============================================================================
=======
# TOTAL: 1
# PASS:  1
# SKIP:  0
# XFAIL: 0
# FAIL:  0
# XPASS: 0
# ERROR: 0
============================================================================
=======
...
username@fedora:~/libxc-7.0.0$ make install
...
username@fedora:~/libxc-7.0.0$ ls ~/libxc-7.0.0/lib
libxc.a  libxcf03.a  libxcf03.la  libxc.la  pkgconfig
```

2. The following was entered into the terminal to install fftw:

```
username@fedora:~/libxc-7.0.0$ cd ~
username@fedora:~$ wget https://www.fftw.org/fftw-3.3.10.tar.gz
...
username@fedora:~$ tar xvf fftw-3.3.10.tar.gz
...
username@fedora:~$ cd fftw-3.3.10/
username@fedora:~/fftw-3.3.10$ ./configure FCC=ifx CC=icx MPICC=mpiicx CFLAGS="-
gcc-sys" --enable-mpi --prefix=$HOME/fftw-3.3.10
...
username@fedora:~/fftw-3.3.10$ make
...
username@fedora:~/fftw-3.3.10$ make install
...
username@fedora:~/fftw-3.3.10$ ls ~/fftw-3.3.10/include/ ~/fftw-3.3.10/lib
```

/home/username/fftw-3.3.10/include/:
fftw3.f fftw3.f03 fftw3.h fftw3l.f03 fftw3l-mpi.f03 fftw3-mpi.f03 fftw3-mpi.h fftw3q.f03

/home/username/fftw-3.3.10/lib:
cmake libfftw3.a libfftw3.la libfftw3_mpi.a libfftw3_mpi.la pkgconfig

3. The following was entered into the terminal to install ELPA:

username@fedora:~/fftw-3.3.10$ cd ~
username@fedora:~$ wget
https://gitlab.mpcdf.mpg.de/elpa/elpa/-/archive/new_release_2025.06.001/elpa-new_release_2025.06.001.tar.gz
...
username@fedora:~$ tar xvf elpa-new_release_2025.06.001.tar.gz
...
username@fedora:~$ cd elpa-new_release_2025.06.001/
username@fedora:~/elpa-new_release_2025.06.001$ ./autogen.sh
…
username@fedora:~/elpa-new_release_2025.06.001$ ./configure FC=mpiifx CC=mpiicx SCALAPACK_LDFLAGS="-L$MKLROOT/lib/intel64 -lmkl_scalapack_lp64 -lmkl_intel_lp64 -lmkl_sequential -lmkl_core -lmkl_blacs_intelmpi_lp64 -lpthread -lm -ldl -liomp5 -lm -Wl,-rpath,$MKLROOT/lib/intel64" SCALAPACK_FC_FLAGS="-L$MKLROOT/lib/intel64 -lmkl_scalapack_lp64 -lmkl_intel_lp64 -lmkl_sequential -lmkl_core -lmkl_blacs_intelmpi_lp64 -lpthread -lm -I$MKLROOT/include/intel64/lp64" --prefix=$HOME/elpa-new_release_2025.06.001 FCFLAGS=-O3 CFLAGS="-O3 -mfma -funsafe-math-optimizations -ftree-vectorize" LIBS="-lmpi -lmpifort" --disable-avx512
...
The following ELPA2 kernels will be build:

real_generic
real_generic_simple
real_generic_simple_block4
real_generic_simple_block6
real_sse_block2
real_sse_block4
real_sse_block6
real_sse_assembly
real_avx_block2
real_avx_block4
real_avx_block6
real_avx2_block2 (default)
real_avx2_block4
real_avx2_block6
complex_generic
complex_generic_simple

```
 complex_sse_block1
 complex_sse_block2
 complex_sse_assembly
 complex_avx_block1
 complex_avx_block2
 complex_avx2_block1 (default)
 complex_avx2_block2

 This version of ELPA support the minimal API version: 20170403
 The current API version is: 20250131
 This version of ELPA support the minimal autotuning version: 20171201
 The current autotune version is: 20250131
...
username@fedora:~/elpa-new_release_2025.06.001$ make
...
username@fedora:~/elpa-new_release_2025.06.001$ make install
...
username@fedora:~/elpa-new_release_2025.06.001$ ls ~/elpa-new_release_2025.06.001/lib
~/elpa-new_release_2025.06.001/include/elpa-2025.06.001/elpa/
/home/username/elpa-new_release_2025.06.001/include/elpa-2025.06.001/elpa/:
elpa_configured_options.h  elpa_generated_c_api.h  elpa.h
elpa_constants.h           elpa_generated.h        elpa_simd_constants.h
elpa_explicit_name.h       elpa_generic.h          elpa_version.h

/home/username/elpa-new_release_2025.06.001/lib:
libelpa.a  libelpa.la  libelpa.so  libelpa.so.19  libelpa.so.19.4.1  pkgconfig
```

4. Go to:
   http://www.wien2k.at/reg_user/index.html

5. Click "Code download (after registration)"

6. Enter your username and password that you were given when you purchased WIEN2k.

7. Click the link "here" in "You can download the complete source code (about 170 MB) from here" to download "WIEN2k_24.1.tar". You should now have the source code package for WIEN2k 24.1.

8. If you have the folder "WIEN2k" in your Linux operating system home directory (for example at /home/username/WIEN2k, where username is replaced by your user name). You can rename it something else, such as "WIEN2k23.2".

9. The following was entered into the terminal to install WIEN2k 24.1:

   ```
   username@fedora:~/elpa-new_release_2025.06.001$ cd ~
   ```

username@fedora:~$ mkdir WIEN2k
username@fedora:~$ cd WIEN2k
username@fedora:~/WIEN2k$ ls
WIEN2k_24.1.tar
username@fedora:~/WIEN2k$ tar xvf WIEN2k_24.1.tar
...
username@fedora:~/WIEN2k$ gunzip *.gz
username@fedora:~/WIEN2k$ chmod +x ./expand_lapw
username@fedora:~/WIEN2k$ export LC_NUMERIC=en_US.UTF-8
username@fedora:~/WIEN2k$ ./expand_lapw
...
continue (y/n)
y
...

Applied patches at: https://github.com/gsabo/WIEN2k-Patches/tree/master/24.1

username@fedora:~/WIEN2k$ ./siteconfig
...
continue or stop (c/s) c

    Press RETURN to continue
...
  Selection: LI
...
    Press RETURN to continue
...
    Your compiler: ifx
...
    Your compiler: icx
...
    Press RETURN to continue
...
Hit Enter to continue
...
 Would you like to use LIBXC (needed ONLY for self-consistent gKS mGGA calculations, for the stress tensor and experts who want to play with different DFT options. It must have been installed before)? (y,N):
y
...
 Do you want to automatically search for LIBXC installations? (Y,n):
Y
 Please specify a comma separated list of directories to search! (If no list is entered, /usr/lib64, /usr/local and /opt will be searched as default):
/home/username/libxc-7.0.0

```
...
 More than one libxc was found in the specified directory(ies).
 Pick one of the following (enter the number of the line of your choice or 0 to manually specify a
path)!:
/home/username/libxc-7.0.0/src/.libs/libxc.a
/home/username/libxc-7.0.0/lib/libxc.a
2
...
    Press RETURN to continue
...
 Do you want to automatically search for FFTW installations? (Y,n):
Y
 Please specify a comma separated list of directories to search! (If no list is entered,
 /usr/lib64, /usr/local and /opt will be searched as default):
/home/username/fftw-3.3.10
...
Do you want to use a FFTW version from the list above? (Y,n):
Y
 Please enter the line number of the chosen version or enter 0 to manually specify your choice!:
2
...
 Please specify the target achitecture of your FFTW library (e.g. lib64) or accept present choice
(enter): lib
...
 Please specify the name of your FFTW library or accept present choice (enter): fftw3
...
  Is this correct? (Y,n): Y
…
 Current settings:
  M   OpenMP switch:          -qopenmp
  O   Compiler options:       -O -FR -mp1 -w -prec_div -pc80 -pad -ip -DINTEL_VML
-traceback -assume buffered_io -I$(MKLROOT)/include
  L   Linker Flags:           $(FOPT) -L$(MKLROOT)/lib/$(MKL_TARGET_ARCH) -lpthread
-lm -ldl -liomp5
  P   Preprocessor flags      '-DParallel'
  R   R_LIBS (LAPACK+BLAS):   -lmkl_intel_lp64 -lmkl_intel_thread -lmkl_core
  F   FFTW options:           -DFFTW3 -I/home/username/fftw-3.3.10/include
      FFTW-LIBS:              -L/home/username/fftw-3.3.10/lib -lfftw3
  X   LIBX options:           -DLIBXC -I/home/username/libxc-7.0.0/include
      LIBXC-LIBS:             -L/home/username/libxc-7.0.0/lib -lxcf03 -lxc

  S   Save and Quit
...
Selection: S
...
```

```
    Press RETURN to continue
...
 Shared Memory Architecture? (y/N):y
  Do you know/need a command to bind your jobs to specific nodes?
  (like taskset -c). Enter N / your_specific_command: N
...
  Do you have MPI, ScaLAPACK, ELPA, or MPI-parallel FFTW installed and intend
   to run finegrained parallel?
...
   (y/N) y
...
   Your compiler: mpiifx
...
 Do you want to use a present ScaLAPACK installation? (Y,n): Y
...
 Do you want to use the MKL version of ScaLAPACK? (Y,n):Y
  Do you use Intel MPI? (Y,n):Y
...
 Is this correct? (Y,n): Y
…
    Press RETURN to continue
...
 Do you want to use ELPA? (y,N):
y
...
Do you want to automatically search for ELPA installations? (Y,n):
Y
Please specify a comma-separated list of directories to search! (If no list is entered,
 /usr/lib64 /usr/local and /opt will be searched as default):
/home/username/elpa-new_release_2025.06.001
Finding the required ELPA files in /home/username/elpa-new_release_2025.06.001.rc1 ....

 More than one version of ELPA found:
/home/username/elpa-new_release_2025.06.001/.libs
/home/username/elpa-new_release_2025.06.001/lib

 Pick one (enter line number) or enter 0 to manually specify a path!:
2
 Present root directory of ELPA is: /home/username/elpa-new_release_2025.06.001/
 Please specify the ROOT-path of your ELPA installation (like /usr/local/elpa/) or accept present
path (Enter):
 Checking for ELPA version ...
 More than one set of include files in your ELPA-ROOT directory. Pick one (enter line number)
or enter 0 to manually specify a version!:
/home/username/elpa-new_release_2025.06.001/elpa
```

```
/home/username/elpa-new_release_2025.06.001/src/elpa1
/home/username/elpa-new_release_2025.06.001/src/elpa2
/home/username/elpa-new_release_2025.06.001/src/elpa_generalized
/home/username/elpa-new_release_2025.06.001/test/Fortran/elpa2
/home/username/elpa-new_release_2025.06.001/test/Fortran/elpa_generalized
/home/username/elpa-new_release_2025.06.001/.fortran_dependencies/elpa2_print_kernels
/home/username/elpa-new_release_2025.06.001/share/doc/elpa
/home/username/elpa-new_release_2025.06.001/include/elpa-2025.01.001
/home/username/elpa-new_release_2025.06.001/include/elpa-2025.01.001/elpa
9
...
 Is this correct? (Y,n):Y
...
 Please specify the lib-directory of your ELPA installation (e.g. lib or lib64):
lib
...
 Is this correct? (Y,n):Y
...
Please specify the name of your installed ELPA library (e.g. elpa or elpa_openmp):
elpa
Your current lib-directory of your ELPA installation is: lib
 Is this correct? (Y,n):Y
 The current library name of your ELPA installation is: elpa
 Is this correct? (Y,n):Y
...
  Is this correct?  (Y,n): Y

     Press RETURN to continue
...
   Please specify your parallel compiler options or accept the recommendations (Enter - default)!:


   Please specify your parallel OMP_SWITCH (type "del" to blank it)
   or accept the recommendations (Enter - default)!:

   Please specify your MPIRUN command or accept the recommendations (Enter - default)!:


     Press RETURN to continue
...
   Current settings:

        Parallel compiler      : mpiifx
        SCALAPACK_LIBS         : -lmkl_scalapack_lp64 -lmkl_blacs_intelmpi_lp64
        FFTW_PLIBS             : -lfftw3_mpi
```

ELPA_OPT : -DELPA -I/home/username/elpa-new_release_2025.06.001/include/elpa-2025.06.001/elpa -I/home/username/elpa-new_release_2025.06.001/include/elpa-2025.06.001/modules
ELPA_LIBS : -lelpa -L/home/username/elpa-new_release_2025.06.001/lib -Wl,-rpath=/home/username/elpa-new_release_2025.06.001/lib
FPOPT(par.comp.options): -O -FR -mp1 -w -prec_div -pc80 -pad -ip -DINTEL_VML -traceback -assume buffered_io -I$(MKLROOT)/include
OMP_SWITCH : -qopenmp
MPIRUN command : mpirun -np _NP_ -machinefile _HOSTS_ _EXEC_

parallel execution:

RP_LIBS : $(R_LIBS)
...
Selection: S
...
Press RETURN to continue
...
Selection: Q
...
Selection: A
...
Compile time errors (if any) were:
<= It should be blank here if successful.
Check file compile.msg in the corresponding SRC_* directory for the compilation log and more info on any compilation problem.

Press RETURN to continue
...
Please enter the full path of the perl program: /usr/bin/perl
...
Press RETURN to continue
...
Please enter the full path to your temporary directory: /tmp
...
Press RETURN to continue
…

10. If it is the first time installing WIEN2k on the computer, enter in the terminal:

username@fedora:~/WIEN2k$ ./userconfig_lapw
...
Specify your prefered editor (default is emacs):
editor shall be: gedit

```
   Set editor to  gedit (Y/n) Y

     Specify your prefered DATA directory, where your cases should be
     stored (for  /home/username/WIEN2k, just enter RETURN key):
     DATA directory: /home/username/wiendata

     Set DATA directory to  /home/username/wiendata (Y/n) Y
...
   Specify your prefered scratch directory, where big case.vector files
     can be stored (Recommended is a local directory (maybe /scratch), not a
     NFS directory. For your working directory, just enter RETURN key):
     scratch directory:

    Set scratch directory to  working directory (Y/n) Y

     Specify your program to read pdf files (default is okular)
     (on some Linux systems use xpdf, evince, pdfstudio, ...):evince
...
     Set PDFREADER to  evince (Y/n) Y

WIEN2k can use OpenMP parallelization on multicore computers.
For details please read the "Parallelization section" of the Usersguide.
Your present computer has 6 cores, but more than 4 (8) cores is useless.
How many cores do you want to use by default (4):1

     Set OMP_NUM_THREADS to  1 (Y/n) Y


!!!  The following lines will be added to your .bashrc file if you continue !!!
     A copy of your current .bashrc will be saved under  .bashrc.savelapw !

# added by WIEN2k: BEGIN
# ------------------------------------------------------
alias lsi="ls -aslp *.in*"
alias lso="ls -aslp *.output*"
alias lsd="ls -aslp *.def"
alias lsc="ls -aslp *.clm*"
alias lss="ls -aslp *.scf* */*scf"
alias lse="ls -aslp *.error"
alias LS="ls -alsp |grep /"
alias pslapw="ps -ef |grep "lapw""
alias cdw="cd /home/username/wiendata"
if [ "$OMP_NUM_THREADS" = "" ]; then export OMP_NUM_THREADS=1; fi
```

```
#export LD_LIBRARY_PATH=.....
export EDITOR="gedit"
export SCRATCH=./
if [ "$WIENROOT" = "" ]; then export WIENROOT=/home/username/WIEN2k; fi
export W2WEB_CASE_BASEDIR=/home/username/wiendata
export STRUCTEDIT_PATH=$WIENROOT/SRC_structeditor/bin
export PDFREADER=evince
export PATH=$WIENROOT:$STRUCTEDIT_PATH:$WIENROOT/SRC_IRelast/script-
elastic:$PATH:.
export OCTAVE_EXEC_PATH=${PATH}::
export OCTAVE_PATH=${STRUCTEDIT_PATH}::

ulimit -s unlimited
alias octave="octave -p $OCTAVE_PATH"
# ----------------------------------------------------
   Do you want to continue (Y/n)? Y
...
   Edit .rhosts file now? (y/N) N
...
username@fedora:~/WIEN2k$ source ~/.bashrc
...
```

11. To setup or start w2web, enter in the terminal:

```
username@fedora:~/WIEN2k$ w2web
#############################################################################
# w2web starter                                          #
# Copyright (C) 2001 luitz.at                                #
#############################################################################
w2web installer on host fedora

#############################################################################
# w2web installer                                        #
# Copyright (C) 2001 luitz.at                                #
#############################################################################

Checking for Installation in /home/username/.w2web/fedora

Creating /home/username/.w2web
Creating /home/username/.w2web/fedora
conf directory does not exist - creating it.
logs directory does not exist - creating it.
sessions directory does not exist - creating it.
tmp directory does not exist - creating it.
```

Installing w2web files ...
Please answer these questions for proper installaltion.
Just press enter for the default value of (in brackets).

Please enter the username: [admin] username
Please enter the password: [password] password
username:password
Remember these. You will need them when you log in.

Select the port to run on: [7890]
Running on port 7890

Please enter this system's hostname: [fedora] localhost
Using localhost

Is this your master node?: [y] y
Installing... Attempting to start now...

Trying to start /home/username/WIEN2k/SRC_w2web/bin/w2web
w2web server started, now point your web browser to
http://localhost:7890

done.

12. The WIEN2k 24.1 installation is now complete. To test if WIEN2k installed okay or not, run the TiC example at [1]. Additional details of the TiC example are given in the WIEN2k usersguide (section “3 Quick Start” starting on page 13) [2].

[1] https://github.com/gsabo/WIEN2k-Docs/blob/main/WIEN2k24.1%20TiC%20Example(Fedora-ifx).pdf
[2] http://susi.theochem.tuwien.ac.at/reg_user/textbooks/usersguide.pdf