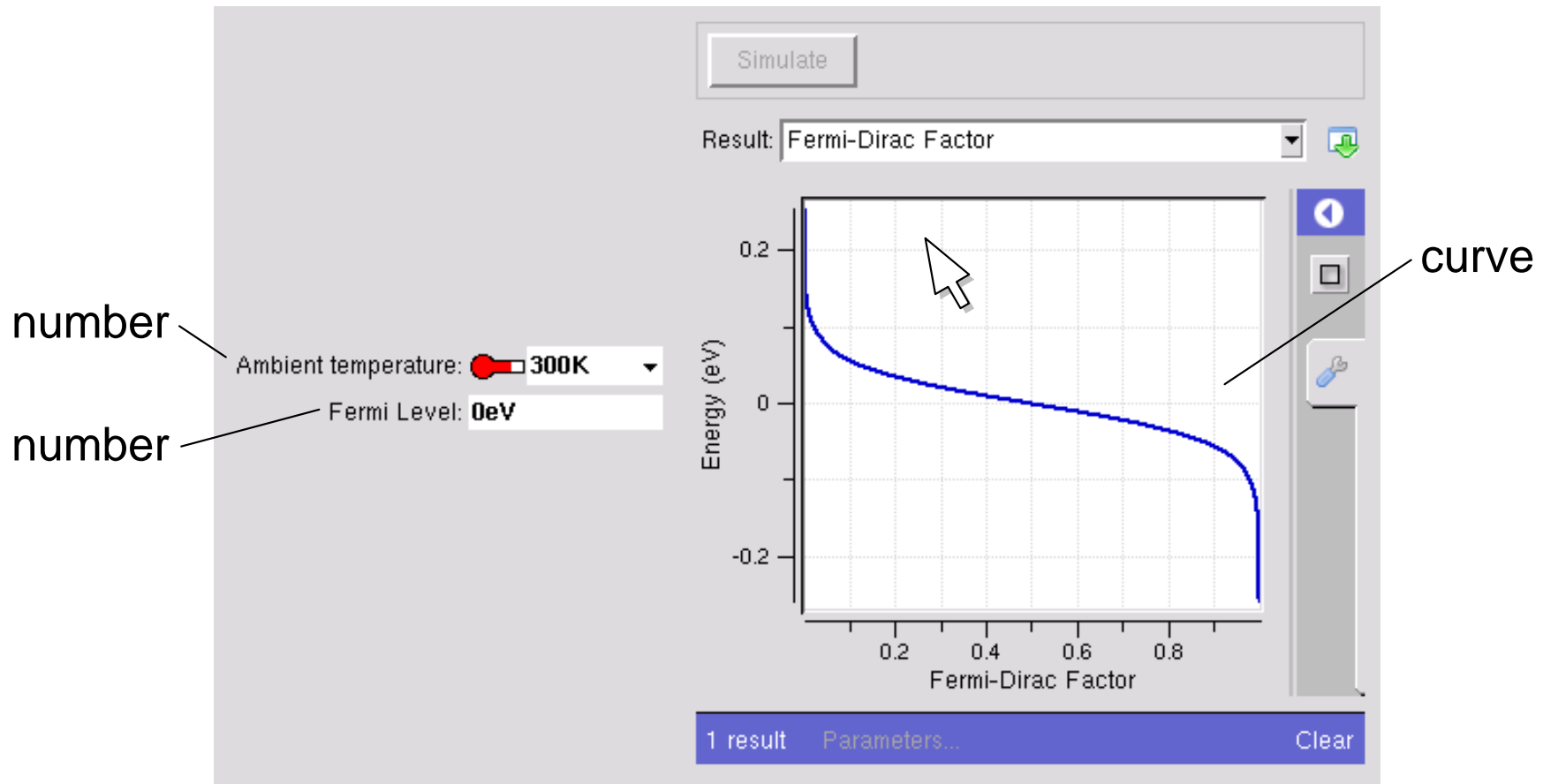


What's Under the Hood?

Michael McLennan

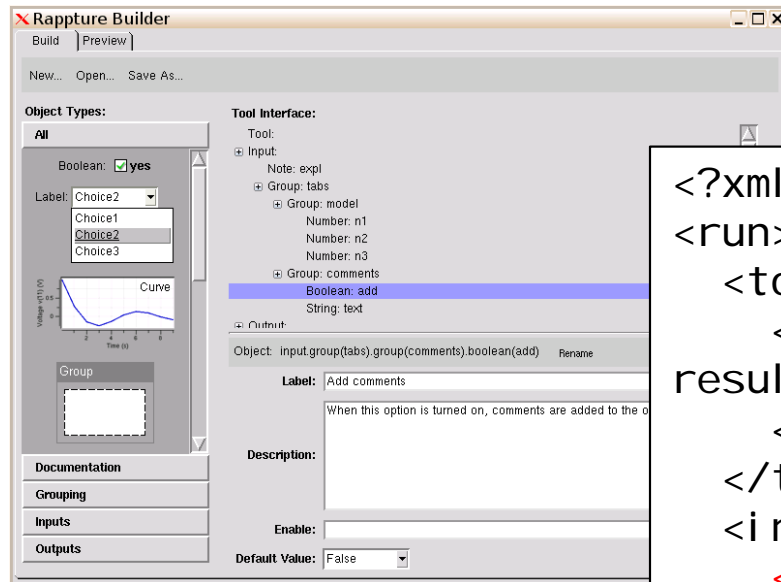
HUBzero® Platform for Scientific Collaboration

Purdue University



How does it work?

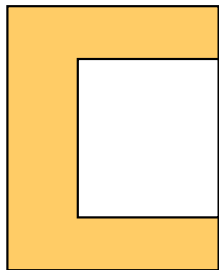
Builder



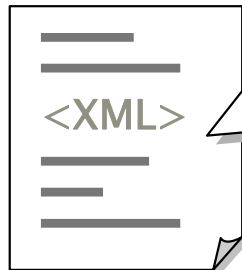
```

<?xml version="1.0"?>
<run>
  <tool >
    <about>Press Simulate to view
    results.</about>
    <command>@tool /fermi @driver</command>
  </tool >
  <input>
    <number id="temperature">...</number>
    <number id="Ef">...</number>
  </input>
  <output>
    <curve id="f12">...</curve>
  </output>
</run>

```



skeleton
program

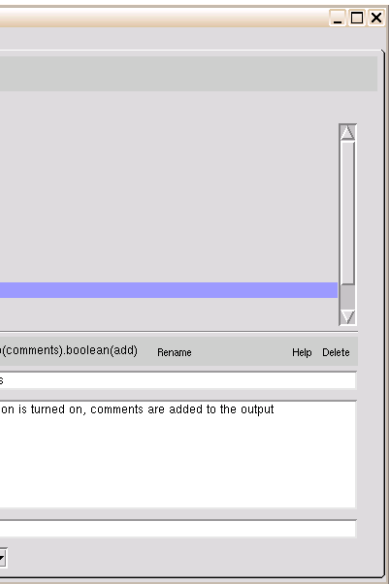


tool.xml

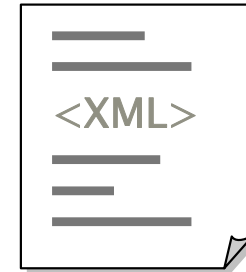
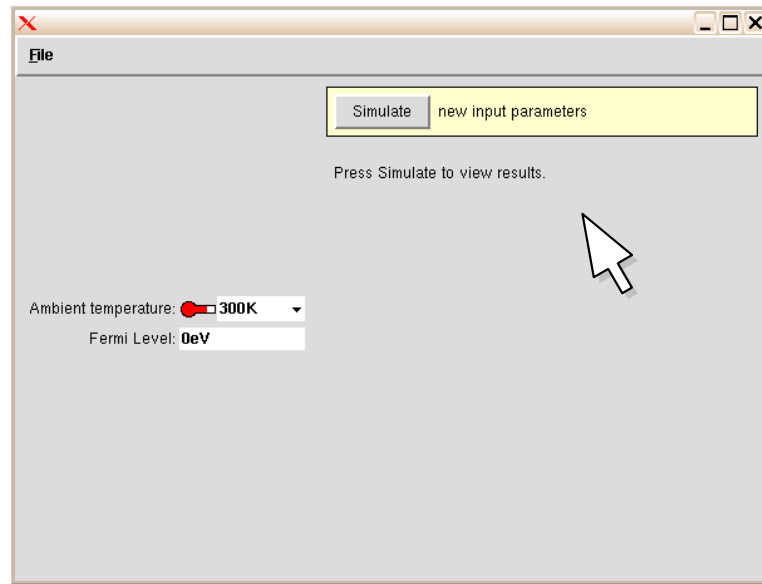
- Info about the tool, how to run it
- Input objects
- Output objects

```
Color xterm  
$ rappture
```

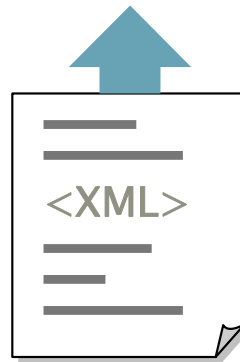
Builder



Runner



driver1827.xml



tool.xml

```
<?xml version="1.0"?>
<run>
  ...
  <i nput>
    <number id="temperature">
      <uni ts>K</uni ts>
      <mi n>0K</mi n>
      <max>500K</max>
      <defaul t>300K</defaul t>

    </number>
    <number id="Ef">
      <uni ts>eV</uni ts>
      <defaul t>0eV</defaul t>

    </number>
  </i nput>
  <output>
    <curve id="f12">...</curve>
  </output>
</run>
```

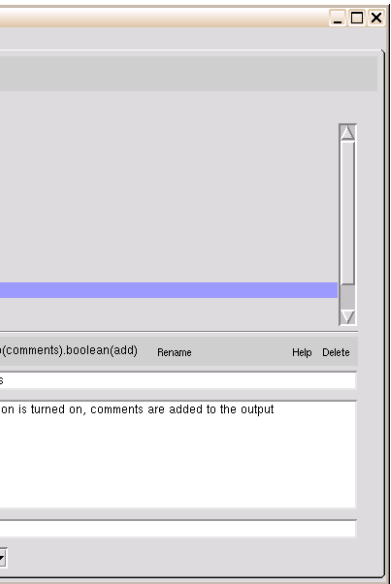
tool.xml

```
<?xml version="1.0"?>
<run>
  ...
  <i nput>
    <number id="temperature">
      <uni ts>K</uni ts>
      <mi n>0K</mi n>
      <max>500K</max>
      <defaul t>300K</defaul t>
      <current>77K</current>
    </number>
    <number id="Ef">
      <uni ts>eV</uni ts>
      <defaul t>0eV</defaul t>
      <current>200meV</current>
    </number>
  </i nput>
  <output>
    <curve id="f12">...</curve>
  </output>
</run>
```

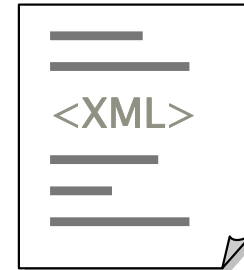
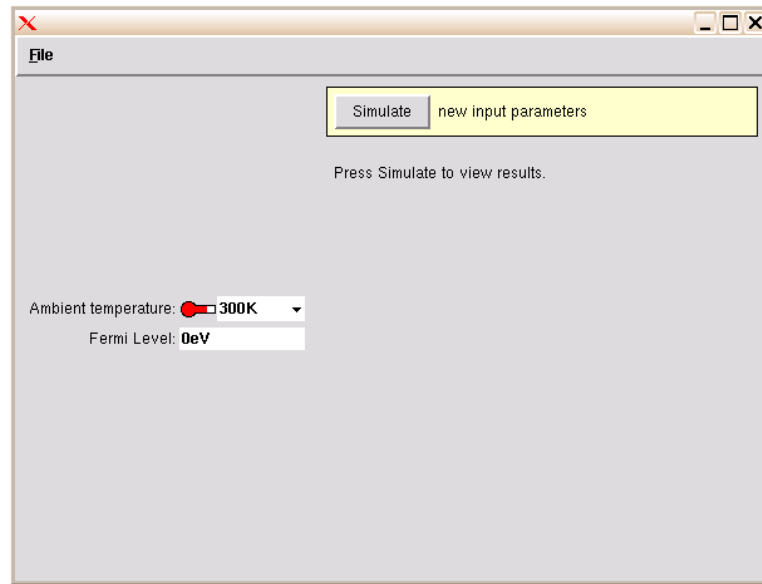
driver1827.xml

```
Color xterm  
$ rappture
```

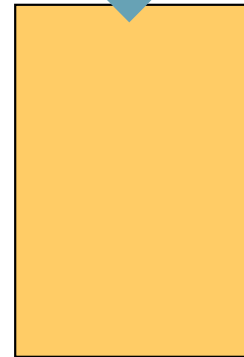
Builder



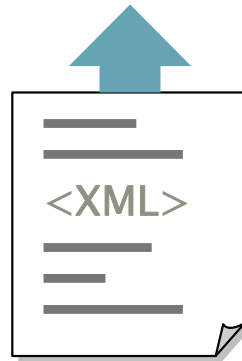
Runner



driver1827.xml



Your Program



tool.xml



run12703129102.xml

```

<?xml version="1.0"?>
<run>
  ...
  <i nput>
    <number id="temperature">...
      <current>77K</current>
    </number>
    <number id="Ef">...
      <current>200meV</current>
    </number>
  </i nput>
  <output>
    <curve id="f12">
      <about>...

      </curve>
    </output>
  </run>

```

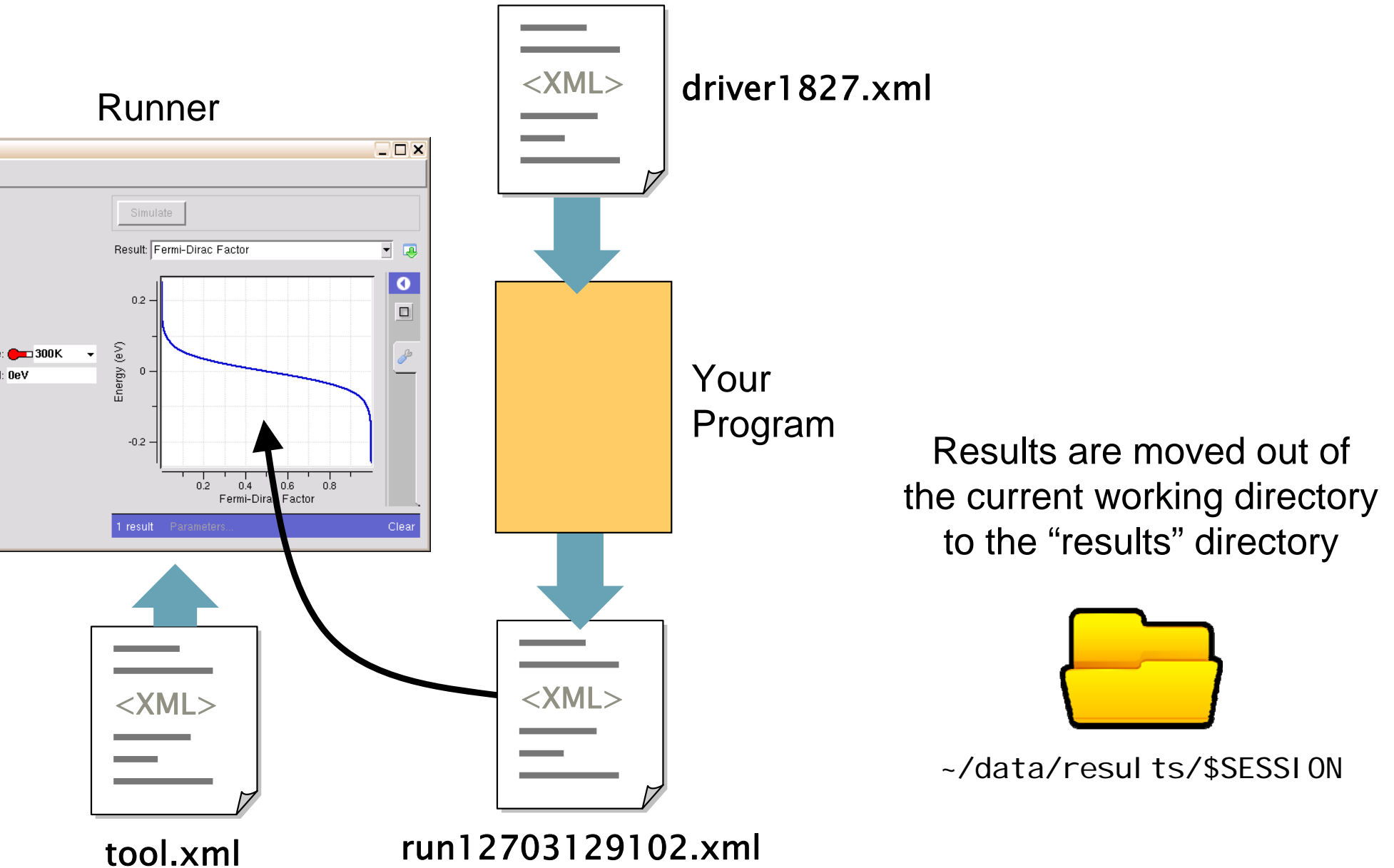
driver1827.xml

```

<?xml version="1.0"?>
<run>
  ...
  <i nput>
    <number id="temperature">...
      <current>77K</current>
    </number>
    <number id="Ef">...
      <current>200meV</current>
    </number>
  </i nput>
  <output>
    <curve id="f12">
      <about>...
      <component>
        <xy>0.999955 -0.25852
0.99995 -0.255935
0.999945 -0.25335...
      </component>
      </curve>
    </output>
  </run>

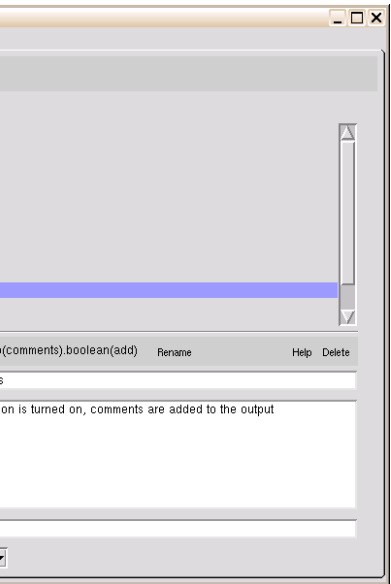
```

run12703129102.xml

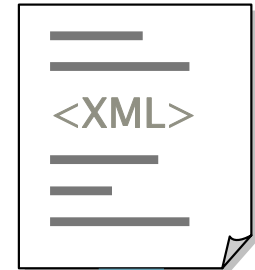
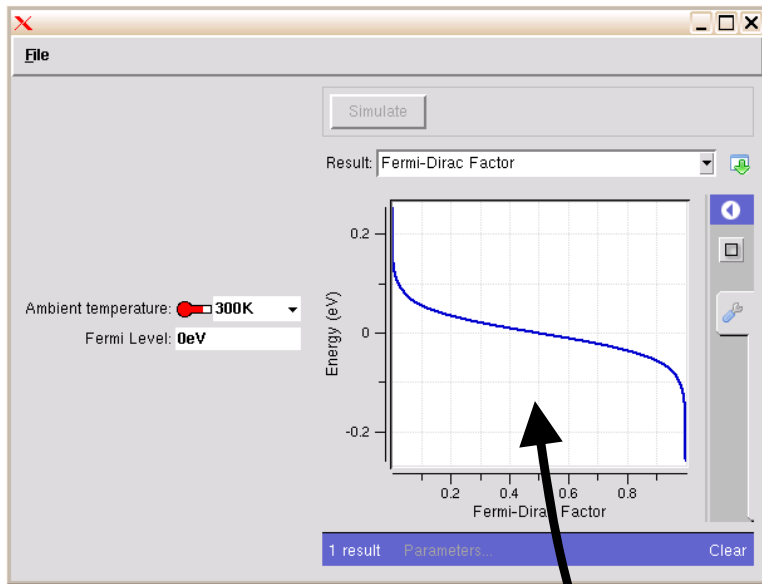



```
Color xterm  
$ rappture
```

Builder



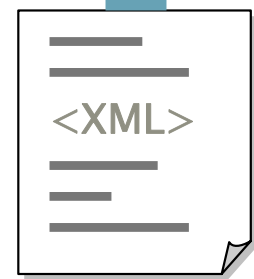
Runner



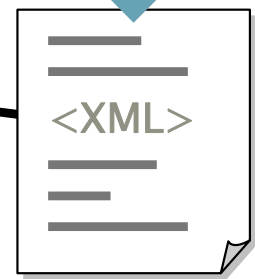
driver1827.xml



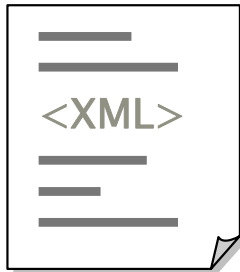
Your Program



tool.xml



run12703129102.xml



run12703129102.xml

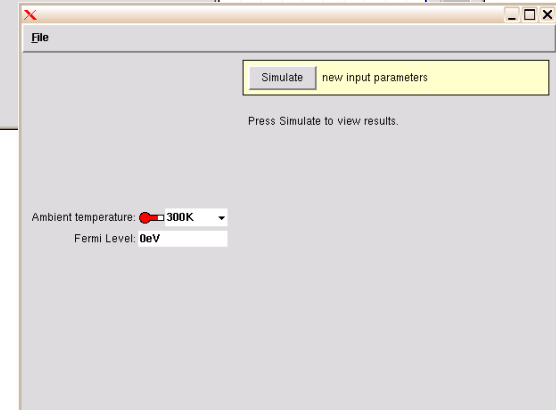
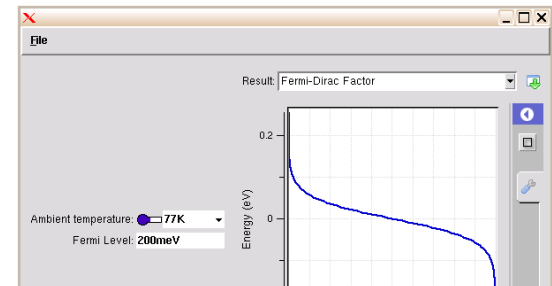
	Tool Defn	Input Vals	Output Vals
tool.xml	✓		
driver.xml	✓	✓	
run.xml	✓	✓	✓

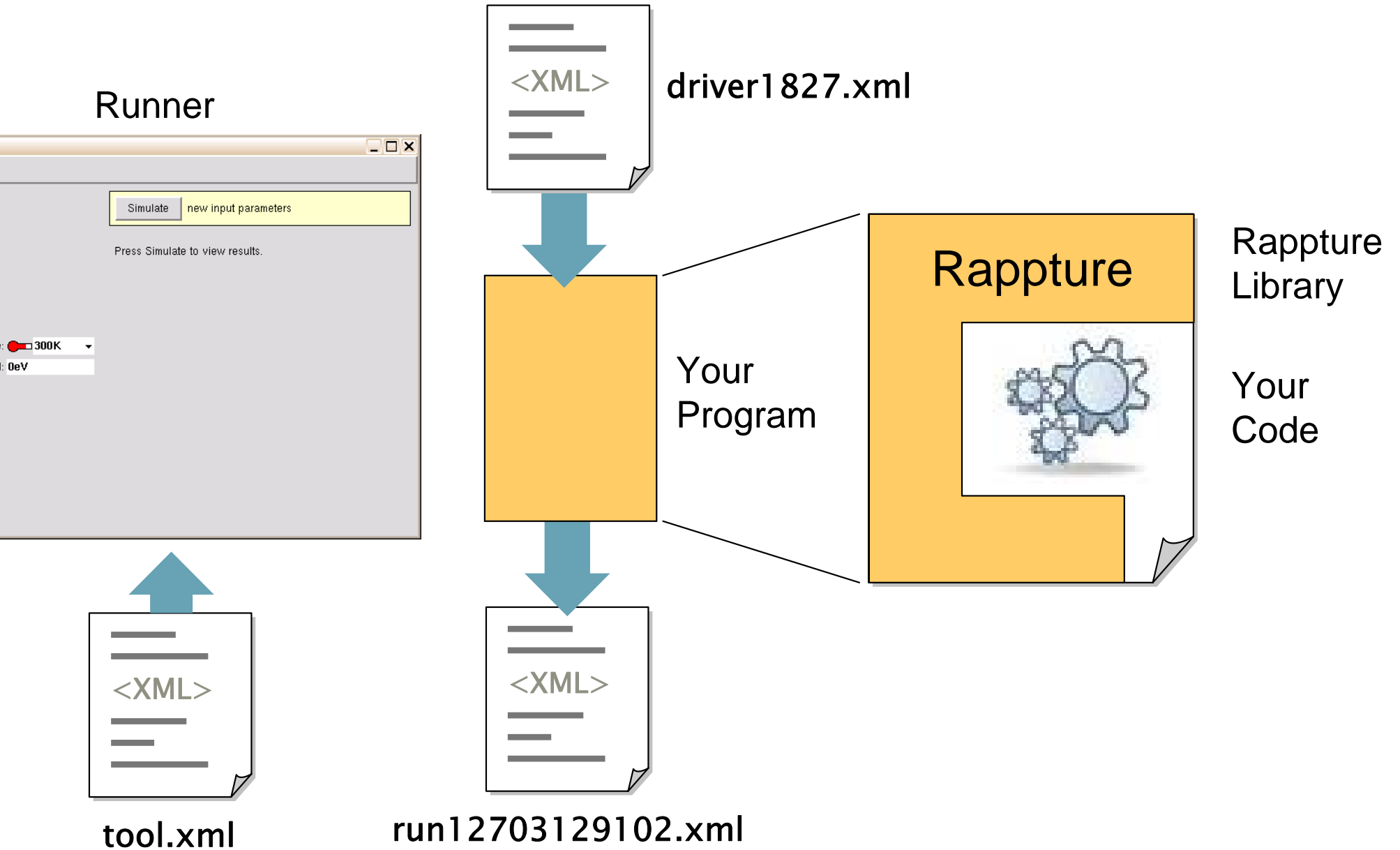
```
Color xterm
$ rappture -load run1301535652532513.xml
```

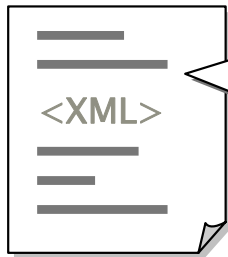
reload old results

```
Color xterm
$ rappture -tool run1301535652532513.xml
```

rerun an old tool



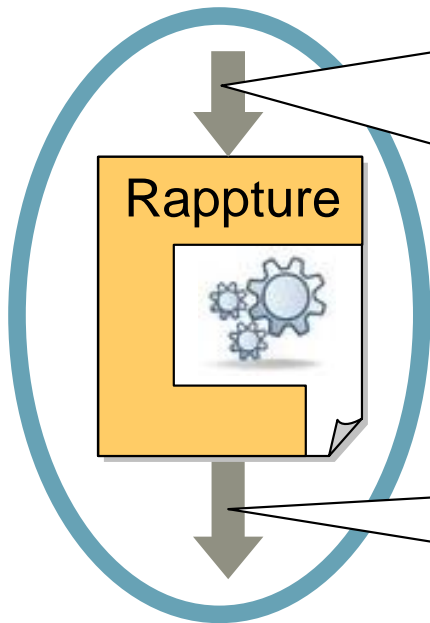




tool.xml

```
<?xml version="1.0"?>
<run>
  <tool >
    <about>Press Simulate to view results.</about>
    <command>python @tool/fermi.py @driver</command>
  </tool >
  <input>
    ...
```

python /apps/yourtool/current/fermi.py driver327.xml



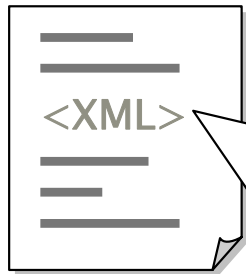
```
import Rappture
import sys
from math import *
```

```
i o = Rappture. I i b r a r y ( s y s . a r g v [ 1 ] )
```

```
Tstr = i o . g e t ( ' i n p u t . n u m b e r ( t e m p e r a t u r e ) . c u r r e n t ' )
Efstr = i o . g e t ( ' i n p u t . n u m b e r ( E f ) . c u r r e n t ' )
...
```

```
i o . p u t ( ' o u t p u t . c u r v e ( f 1 2 ) . c o m p o n e n t . x y ' , x y d a t a )
```

```
Rappture. r e s u l t ( i o )
s y s . e x i t ( )
```



tool.xml

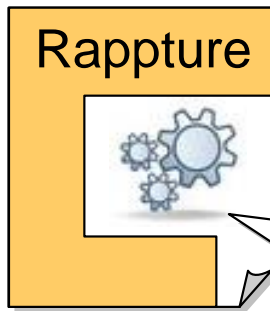
```

<?xml version="1.0"?>
<run>
  ...
  <i nput>
    <number id="temperature">
      <current>300K</current>
    </number>
  ...
</i nput>

  <output>
    <curve id="f12">
      <component>
        <xy>2.102 6.454
      ...
    </curve>
  </output>

```

i nput	. number(temperature)
	. current
output	
	. curve(f12)
	. component
	. xy



Your Program

```

...
Tstr = i o.get(' i nput. number(temperature). current' )
Efstr = i o.get(' i nput. number(Ef). current' )

i o.put(' output. curve(f12). component. xy' , xydata)
...

```

Download the following tool:

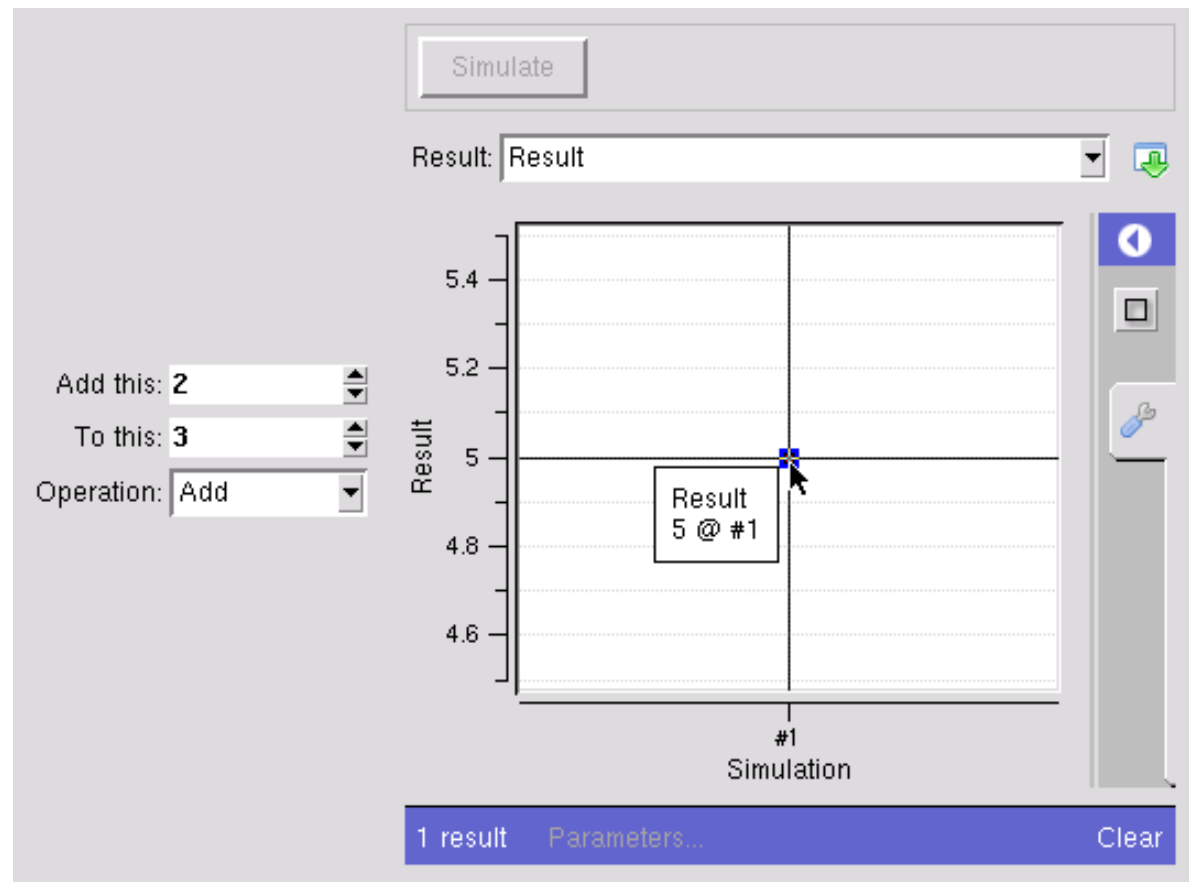
```
% wget https://nanohub.org/tools/bootcamp/raw-attachment/wiki/WikiStart/ex2.tgz
```

Unpack and run:

```
% tar xvzf ex2.tgz
```

```
% cd ex2
```

```
% rappture
```

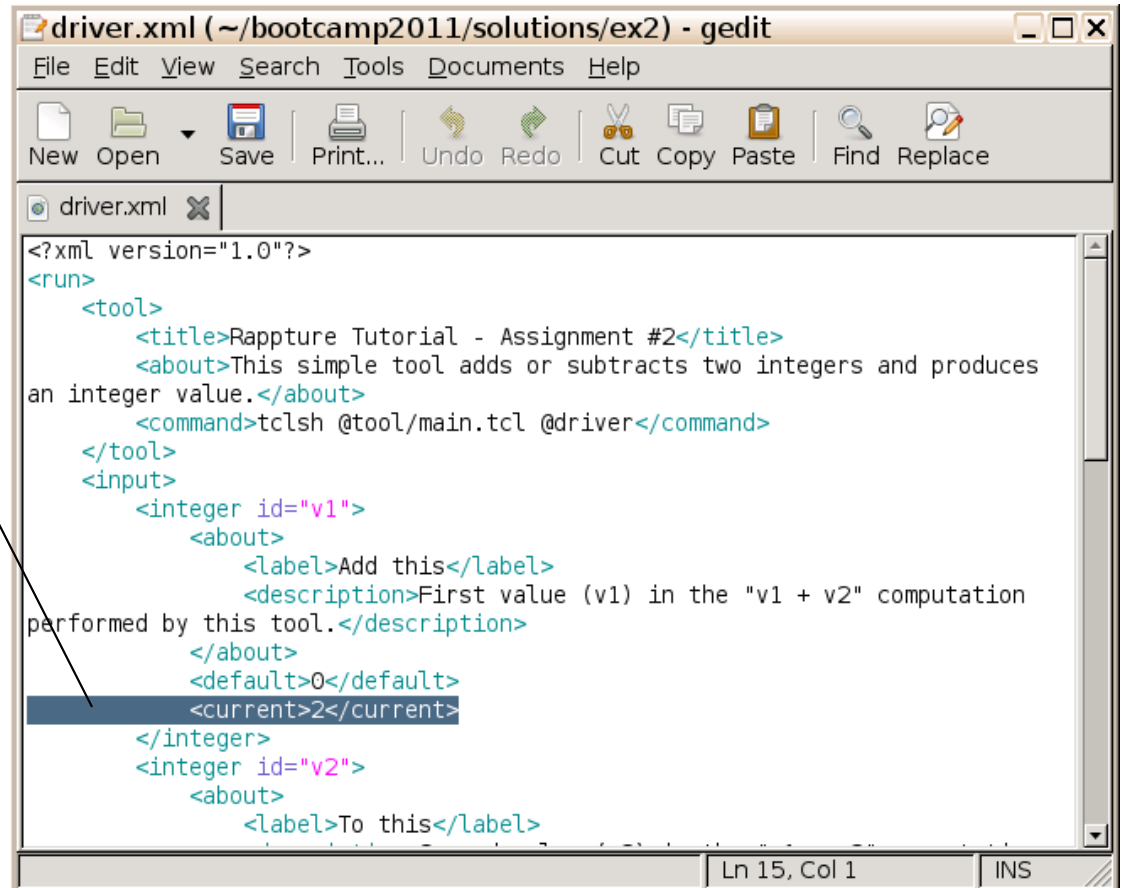


Create a “driver” file by hand:

```
% cp tool.xml driver.xml
```

```
% gedit driver.xml
```

Copy/paste each
<default> value
And fill in a
<current> value



```
<?xml version="1.0"?>
<run>
  <tool>
    <title>Rappture Tutorial - Assignment #2</title>
    <about>This simple tool adds or subtracts two integers and produces
an integer value.</about>
    <command>tclsh @tool/main.tcl @driver</command>
  </tool>
  <input>
    <integer id="v1">
      <about>
        <label>Add this</label>
        <description>First value (v1) in the "v1 + v2" computation
performed by this tool.</description>
      </about>
      <default>0</default>
      <current>2</current>
    </integer>
    <integer id="v2">
      <about>
        <label>To this</label>
```

Run it by hand:

```
% tclsh main.tcl driver.xml
```

Now, edit <command> in the tool.xml to make the tool run properly