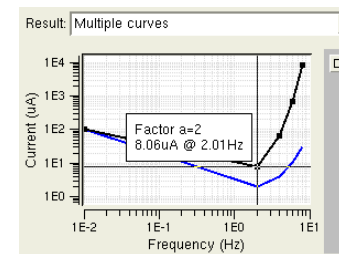
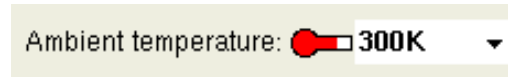
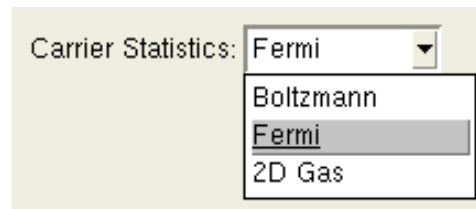
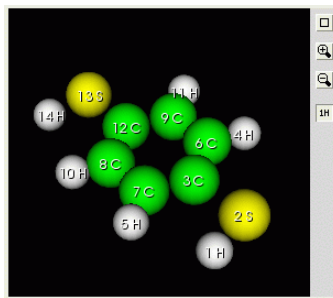


# More Rappture Objects



Michael McLennan  
Software Architect  
HUBzero™ Platform for Scientific Collaboration

## Group related elements

Minority carrier lifetimes

For electrons: **1e-6**

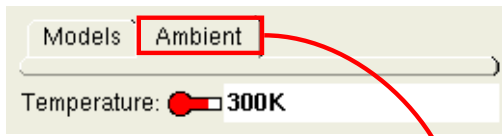
For holes: **1e-6**

```
<group id="tau" >
  <about>
    <label>Minority carrier lifetimes</label>
  </about>

  <number id="taun">
    <about> <label>For electrons</label> </about>
    <default>1e-6</default>
  </number>

  <number id="taup">
    <about> <label>For holes</label> </about>
    <default>1e-6</default>
  </number>
</group>
```

Group of groups → tabs



```
<group id="tabs">

  <group id="models">
    <about> <label>Models</label> </about>
    ...input elements for this tab...
  </group>

  <group id="ambient">
    <about> <label>Ambient</label> </about>
    <number id="temp">
      <about> <label>Temperature</label> </about>
      <units>K</units>
      <default>300K</default>
    </number>
  </group>

</group>
```

# Enable/disable to remove clutter

*Disable inputs when they're not needed*

Recombination Model:  no

Minority Carrier Lifetime for electrons: 1e-6

Minority Carrier Lifetime for holes: 1e-6

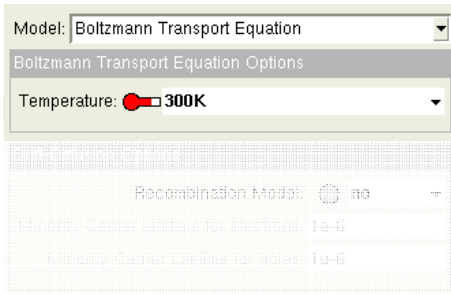
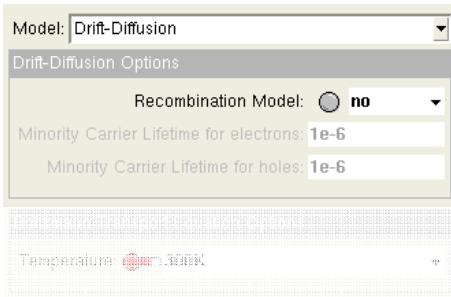
Enabled only when  
Recombination Model is "yes"

```
<i nput>
  <boolean id="recomb">
    <about>
      <label>Recombination Model</label>
    </about>
    <default>off</default>
  </boolean>

  <number id="taun">
    <about>
      <label>Minority Carrier Lifetime for electrons</label>
      <enable>input.bool_ean(recomb)</enable>
    </about>
    <default>1e-6</default>
  </number>
  ...
```

# Enable/disable to remove clutter

*Disable a group to hide all of the controls within it*



```

<group id="dd" > Show this panel when
                    Model is set to "dd" (Drift-Diffusion)
  <about>
    <label >Dri ft-Di ffusi on Opti ons</label >
    <enabl e>i nput. choi ce(model ) == "dd" </enabl e>
  </about>
  ...
</group>

<group id="bte" > Show this panel when
                    Model is set to "bte" (Boltzmann Transport Eqn)
  <about>
    <label >Bol tzmann Transp ort Equati on Opti ons</label >
    <enabl e>i nput. choi ce(model ) == "bte" </enabl e>
  </about>
  ...
</group>

```

# Enable/disable based on numbers

Quantum Mechanical Options

Tight-binding Energy: **2.9eV**

High-energy lifetime: **10ns**

Enabled only when  
Tight-binding energy  $\geq 3\text{eV}$

```
<i nput>
  <group id="negf">
    <about><label>Quantum Mechanical Options</label></about>
    <number id="tbe">
      <about> <label>Tight-binding Energy</label> </about>
      <units>eV</units>
      <default>3.12eV</default>
    </number>
    <number id="tau">
      <about>
        <label>High-energy lifetime</label>
        <enable>input.group(negf).number(tbe):eV >= 3</enable>
      </about>
      <units>ns</units>
      <default>10ns</default>
    </number>
  </group>
  ...
</i nput>
```

XML way of saying  $\geq$

Convert value to eV

*Multiple pages of inputs, needed only for complex tools*



<i nput >

<phase i d="one" >

<about > <l abel >Fi rst Page</l abel > </about >

<stri ng i d="fi rst" >

<about > <l abel >Fi rst i nput</l abel > </about >

<defaul t>one</defaul t>

</stri ng >

</phase >

<phase i d="two" >

<about > <l abel >Second Page</l abel > </about >

<stri ng i d="second" >

<about > <l abel >Second i nput</l abel > </about >

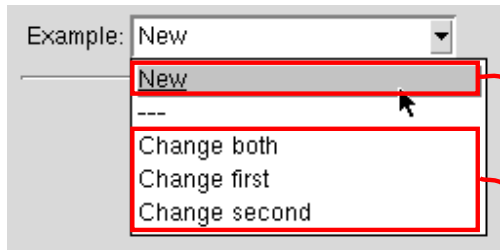
<defaul t>two</defaul t>

</stri ng >

</phase >

</i nput >

## Load various example files into the interface



These files sit in  
@tool /examples  
@tool is where tool.xml sits

```

</loader>
  <about>
    <label>Example</label>
    <description>This loads examples.</description>
  </about>

  <new>new.xml</new>
  <example>*.xml</example>

  <default>new.xml</default> ——— Load by default
</loader>
  
```



## How do you make an example file?

```
cp tool.xml examples/both.xml  
vi examples/both.xml
```

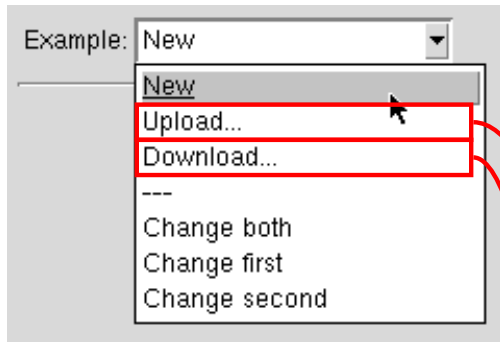
Add a description  
for the example

```
<?xml version="1.0"?>  
<run>  
  <about>  
    <label>Change both</label>  
    <description>This example changes both inputs,  
    #1 to "first" and #2 to "second"</description>  
  </about>
```

Set a <current>  
value for each  
element you want  
to set

```
  ...  
  <input>  
    <string id="one">  
      <current>first</current>  
    </string>  
    <string id="two">  
      <current>second</current>  
    </string>  
  </input>  
</run>
```

*Structure of physical system being simulated*



Prompts the user to upload directly into various controls

Most useful for <string> inputs

Allows the user to download input values, edit, and upload again

```

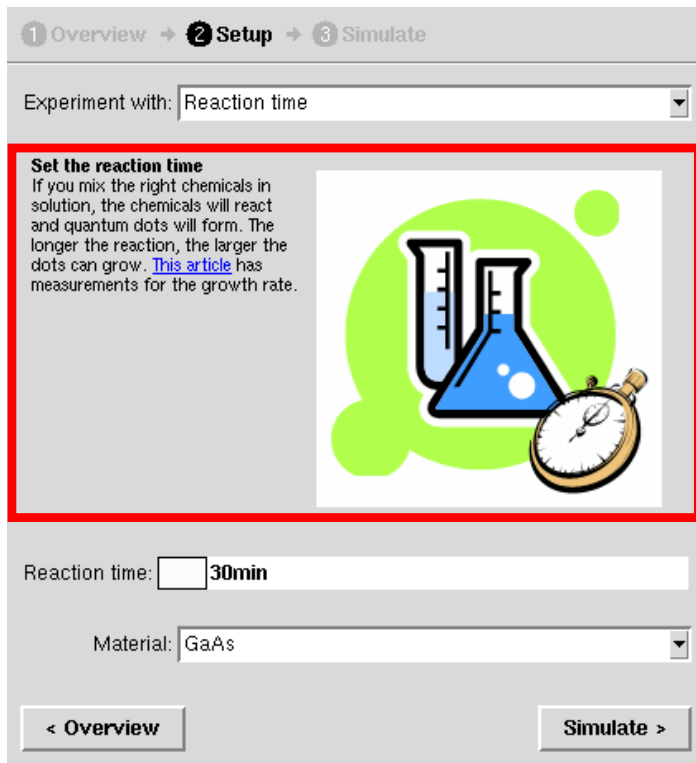
<loader>
  <about>
    <label>Example</label>
    <description>This loads examples.</description>
  </about>
  <upload>
    <to>input.string(ideck)</to>
    <to>input.string(datafile)</to>
  </upload>
  <download>
    <from>input.string(ideck)</from>
    <from>input.string(datafile)</from>
  </download>

  <new>new.xml</new>
  <example>*.xml</example>

  <default>new.xml</default>
</loader>
  
```

# Set the stage

Use `<note>` elements to explain your tool to the user:



- Not an input
- Descriptive text for the user
- Full HTML support

```
<i nput >
  <note >
    <contents >fi l e : //bysi ze. html </contents >
  </note >
  ...
```

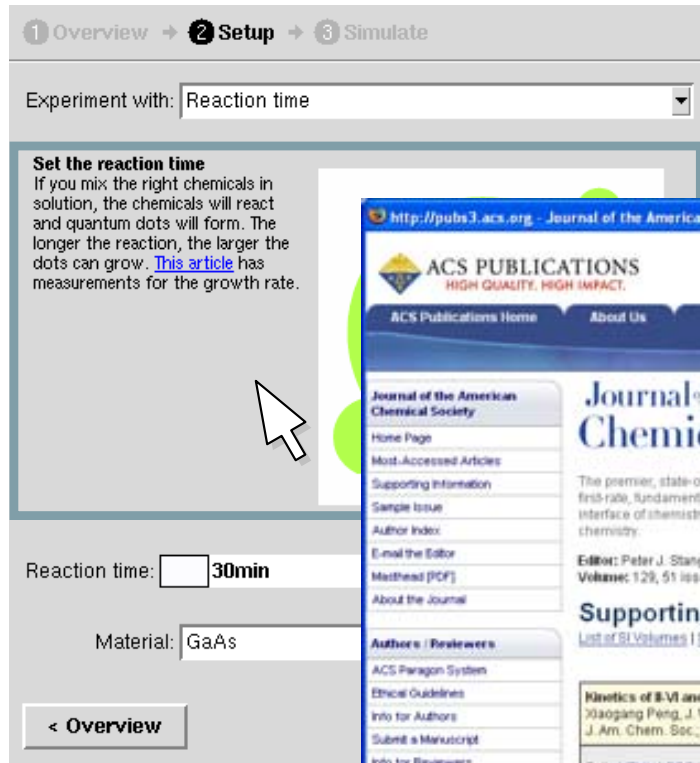
file: docs/bysi ze. html

```
<html >
<body >
<p >

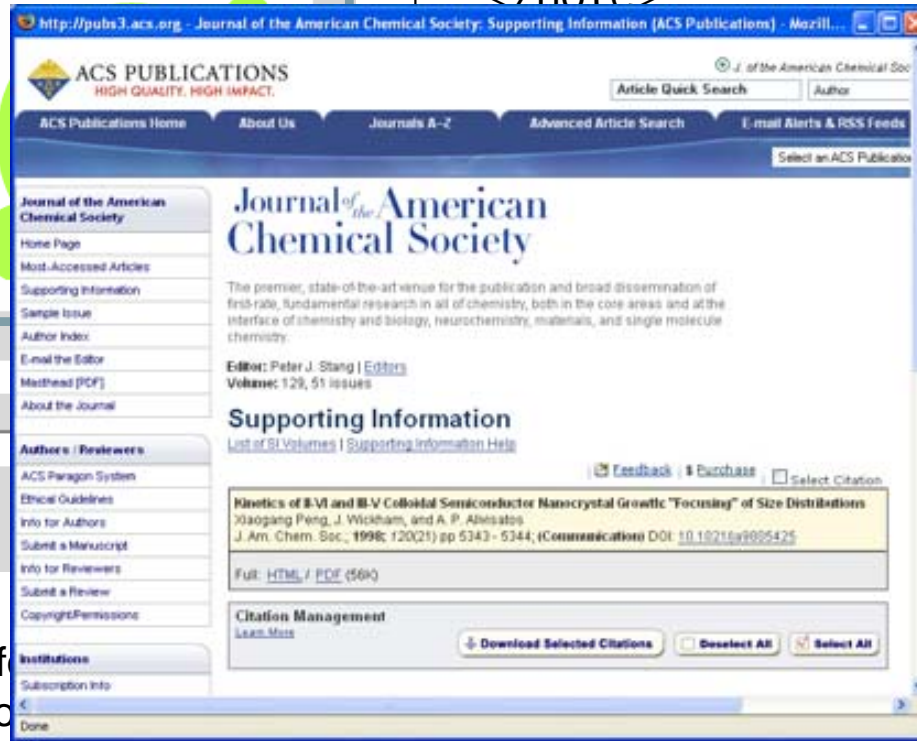
<b>Set the reaction time</b><br />
If you mi x the ri ght chemi cals i n sol uti on,
the chemi cals wi ll react and quanti m dots
wi ll form. The l onger the reacti on, the
...
```

# Set the stage

Use `<note>` elements to explain your tool to the user:



```
<input>
<note>
  <contents>file://bysize.html</contents>
</note>
```



```
ml
right; margin: 8px; "
time</b><br/>
chemicals in solution,
react and quantum dots
er the reaction, the
```

- Not an input
- Descriptive text for
- Full HTML support

# Tour the zoo

rappture\_xml\_elements - Rappture - Trac - Mozilla Firefox

Getting Started Latest Headlines

**NGN nanoFORGE**

Wiki Timeline Browse Source View Tickets Search

### Zoo of Inputs/Outputs

Welcome to the zoo of Rappture elements! This page shows the various snippets of XML code needed to create a Rappture tool.xml file.

#### Overall Structure

Each tool is described by a tool.xml file, which has the following structure:

```
<?xml version="1.0"?>
<tool>
  <title>Name of the tool</title>
  <about>Description and credits</about>
  <command>
    @tool/path/to/executable @driver
  </command>
  <limits>
    <cpulimit>900</cpulimit>
    <filesize>1000000</filesize>
  </limits>
  <layout>xxx</layout>
  <control>xxx</control>
  <analyser>xxx</analyser>
  <reportJobFailures>1</reportJobFailures>
</tool>
<input>
  ..see Element Index below...
</input>
<output>
  ..see Element Index below...
</output>
</tool>
```

The <tool> section describes the underlying compute engine and includes the command needed to run it. This can be any Unix-style command line. The @tool keyword gets replaced with the name of the directory containing the tool.xml file. The

Carrier Statistics: Fermi  
Boltzmann  
Fermi  
2D Gas

Ambient temperature: 300K

Grid points: 100

## Zoo of Examples

- Complete catalog of data objects online
- See screen shots
- Copy xml code