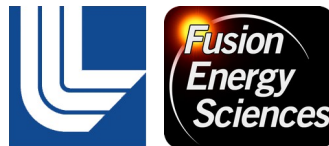


Corsica with Matlab/Simulink Control

Bill Meyer

Corsica Winter School

January 26-28, 2016



This work was performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Security, LLC, Lawrence Livermore National Laboratory under Contract DE-AC52-07NA27344.

Corsica with Simulink Control Prerequisites

- **Corsica only control simulation**

- **Corsica RPC package**

```
corsica> list packages
```

Priority	Name	Long Name	Status
16	rpc	rpc: Remote access routines	-- up --

- **Matlab compiled corsicaconnect and corsicaparser**
- **Simulink S-Functions corsicasink and corsicasource**
 - Utilizes the rpc client side to Corsica's rpcserver
- **Corsica user written Basis script to act as control hook routine**
 - Executed from inside circuit equation calculation
 - Input/output variables are read/written in the rpc package
 - Calls rpc.rpcserver to do communication
 - Allows Simulink to access input/output variables

Control hook only implemented for ITER

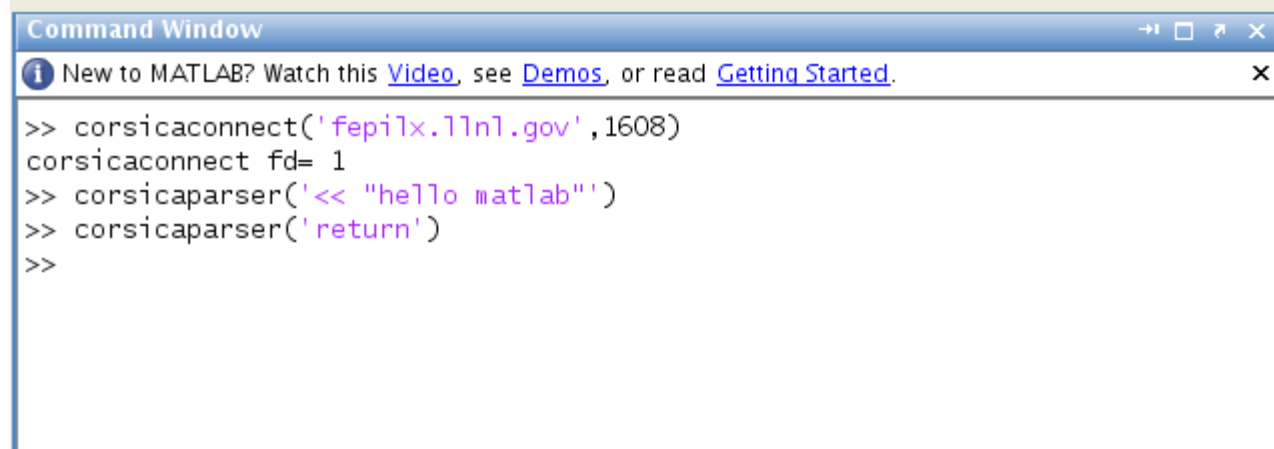
RPC – Corsica Remote Procedure Call Package

- **Only two functions**
 - **rpcinit([port])**
 - **Port** – tcp port number to listen for client connections on
 - **Only system root can listen on ports < 1025**
 - **Returns socket number**
 - **rpcserver([timeout],[socket])**
 - **Timeout** – listen client connections for timeout seconds
 - **Timeout = 0 will listen forever or until client issues return command**
 - **Socket not needed for a single server thread**
 - **Provides 3 services**
 - **Parser**
 - **Data import**
 - **Data export**

Connecting Matlab to Corsica

- **Corsica**

```
corsica> rpcinit(1608)
rpcinit(1608) = 7
corsica> rpcserver
hello matlab
rpcserver = 1
corsica>
```
- **Matlab**
 - One-time open socket connection
 - Parser command issued to initialize simulation
 - Set reference values



```
Command Window
New to MATLAB? Watch this Video, see Demos, or read Getting Started.
>> corsicaconnect('fepilx.llnl.gov',1608)
corsicaconnect fd= 1
>> corsicaparser('<< "hello matlab"')
>> corsicaparser('return')
>>
```