Maxwell: bringing cloud-powered electromagnetic simulations to Matlab

Advanced user interface tutorial

- Quick-start

- How Maxwell uses the cloud (EC2)

- How Maxwell solves electromagnetics

- Examples

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Definitions

- What is Maxwell?

  - a Matlab toolset
  - that uses Amazon's Elastic Compute Cloud (EC2)
  - to solve frequency-domain electromagnetic simulations.

- Maxwell provides two user interfaces: advanced and other

  - advanced:
  - other:

- This presentation covers the advanced interface

Quick-start

- Sign up at

```
% Download maxwell.m
>> urlwrite('m.lightlabs.co', 'maxwell.m');

% Provide AWS credentials and launch a 2-node cluster.
>> maxwell.aws_credentials('aws-access-id', 'aws-secret-key');
>> maxwell.launch('cluster-name', 2);

% Run a 1-node simulation.
>> [E, H] = maxwell.solve('cluster-name', 1, ...);

% Terminate cluster
>> maxwell.terminate('cluster-name');
```

Wait, what just happened?

- `urlwrite()` downloaded the advanced interface for Maxwell,

- `maxwell.aws_credentials()` provided the AWS credentials that

- `maxwell.launch()` needed to create a cluster on EC2.

- `maxwell.solve()` solved the electromagnetic simulation on the cluster and downloaded the resulting electromagnetic fields, and

- `maxwell.terminate()` terminated the EC2 cluster.

How Maxwell uses the cloud (EC2)
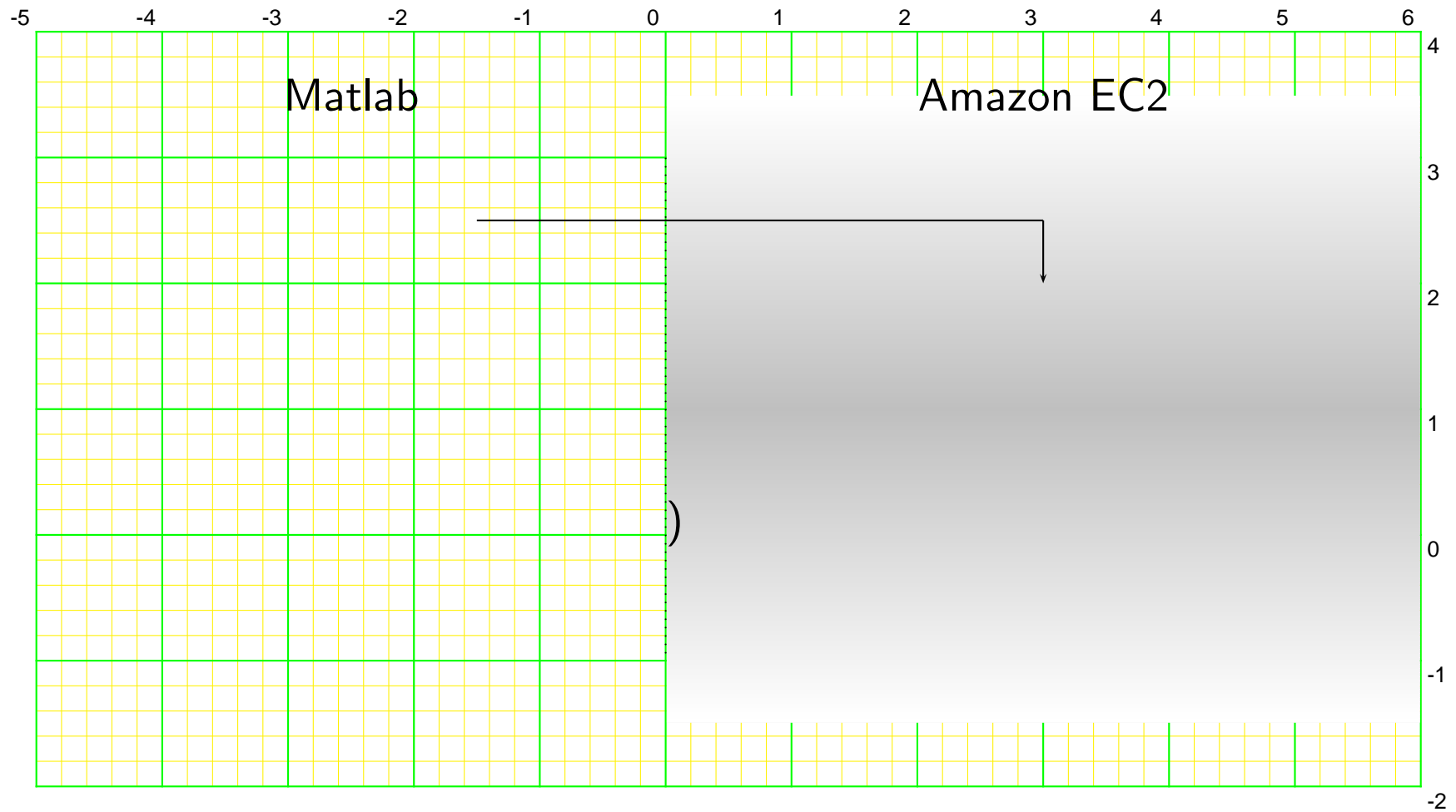
- Wait, what's going on here?

How Maxwell solves electromagnetics

Examples