

# Introduction to the PRACE Project 2016143321: “SREDIT - Simulations of Radiated Emissions in Densely Integrated Technologies”

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UNIVERSITÀ  
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DELLE MARCHE

# Introduction

What is PRACE? <http://www.prace-ri.eu/prace-in-a-few-words/>

The screenshot shows a Mozilla Firefox browser window displaying the PRACE website. The browser's address bar shows the URL [www.prace-ri.eu/prace-in-a-few-words/](http://www.prace-ri.eu/prace-in-a-few-words/). The website's navigation menu includes links for Home page, FAQ, Job vacancies, Press Releases, Newsletters, and Contact PRACE. The main banner features the PRACE logo and the text "PARTNERSHIP FOR ADVANCED COMPUTING IN EUROPE".

**About PRACE**

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## PRACE in a few words

### PRACE Mission

The mission of PRACE (Partnership for Advanced Computing in Europe) is to enable high impact scientific discovery and engineering research and development across all disciplines to enhance European competitiveness for the benefit of society. PRACE seeks to realize this mission by offering world class computing and data management resources and services through a [peer review process](#).

PRACE also seeks to strengthen the European users of HPC in industry through various initiatives. PRACE has a strong interest in improving energy efficiency of computing systems and reducing their environmental impact.

### PRACE Research Infrastructure (RI)

PRACE is established as an international not-for-profit association (aisbl) with seat in Brussels. It

**Contact**

**PRACE WHITEPAPERS**

**CODE VAULT**

**PRACE AUTUMN**

# Introduction

## This project

- ★ Four groups: Ancona, Granada, Nottingham, York.
- ★ Three year long. From September 1 2016 to August 31 2019.
- ★ Granted CPU time: 12,353,536 core hours for the first year.
- ★ Value: about 77,000 Euro (to be better defined).
- ★ Machine: Marconi KNL (CINECA, Italy)
- ★ Cluster characteristics:
  - ▶ Based on the LENOVO NeXtScale platform and the next generation of the Intel Xeon Phi product family.
  - ▶ Partition A2, KNL 68 Cores, 1.4 GHz, 3600 nodes, 11 PFs.
  - ▶ Operating system: GNU/Linux.
  - ▶ Distribution: CentOS Linux 7 (Core).

# Access to the resources

First step: registration in <https://userdb.hpc.cineca.it/>

The screenshot shows a Mozilla Firefox browser window with the title "Welcome to HPC@CINECA User Portal | UserDB @ CINECA - Mozilla Firefox". The address bar shows the URL "https://userdb.hpc.cineca.it". The page features the CINECA logo and the text "UserDB SuperComputing Applications and Innovation".

**User login**

E-mail \*

Password \*

• Create new user  
• Request new password

## Welcome to HPC@CINECA User Portal

You need to be a registered member to access the UserDB portal.

Using this portal a user can:

- ask for an HPC username;
- check the active projects;
- access the IS CRA site for submitting HPC project proposals;
- access the LISA site for submitting HPC project proposals (reserved to researchers in Regione Lombardia);
- view statistics on the use of HPC systems (not available yet);
- and MUCH MORE.....

**Please note:**

this portal has been updated (one year ago) to a new framework technology and a new service "LISA access" has been addressed for the submission of HPC projects (ONLY FROM regione lombardia)

# Our Code

## Simulations

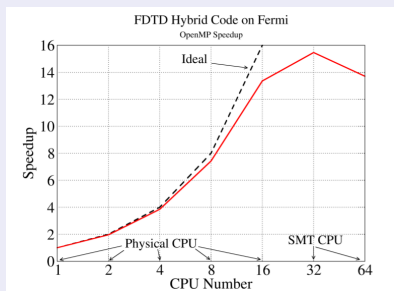
- ★ The whole reverberation chambers, including stirrers, antennas, and devices.
- ★ A device in an ideal reverberation chamber, by applying the plane wave superposition.

## Modules

- ★ The numerical simulation is divided into three modules that are managed by a unique, single-step job.
- ★ An electromagnetic solver based on the finite difference time domain (FDTD) method.
- ★ A fast Fourier transform (FFT) module to obtain the frequency domain behavior.
- ★ A statistical module to obtain the reverberation chamber properties.

# Code Performance

## OpenMP speedup on FERMI



## MPI speedup on MARCONI A1

