

The Beams and Applications Seminar Series

Exploration of Optimization Techniques for Accelerator Design

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ANL

**Bldg. 401, Room B-2100
Wednesday April 4, 3:00 pm**

Host: Michael Borland

Abstract:

Optimization through simulation is one of the most time-consuming tasks in accelerator design, especially for high dimensional problems. We explored several parallel optimization techniques and successfully applied them to some real world optimization problems. Given sufficient computing resources, parallel optimizations promise to not only solve optimization problem significantly faster and open the possibility of "real time" optimization for complex accelerator operation problems, but also make optimization results more reliable.

A brief introduction of parallel programming techniques used in Pelegant will be given in the presentation at first. Then we will discuss several optimization methods, such as simplex, genetic, particle swarm, as well as their parallel implementations. Some real accelerator optimization problems are followed. A short 3D movie created with the visualization software ParaView using the optimization data from Pelegant will be presented for illustrating the process of parallel optimization.

For more information visit

http://aps.anl.gov/News/Meetings/Beams_and_Applications_Seminars/

Visitors from off-site please contact Carmen Nolasco
(mnolasco@aps.anl.gov, 630-252-6159) to arrange for a gate pass.