

Online tuning of storage ring non-linear dynamics at SIRIUS and fast ORM measurement

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Online optimization of Dynamic Aperture

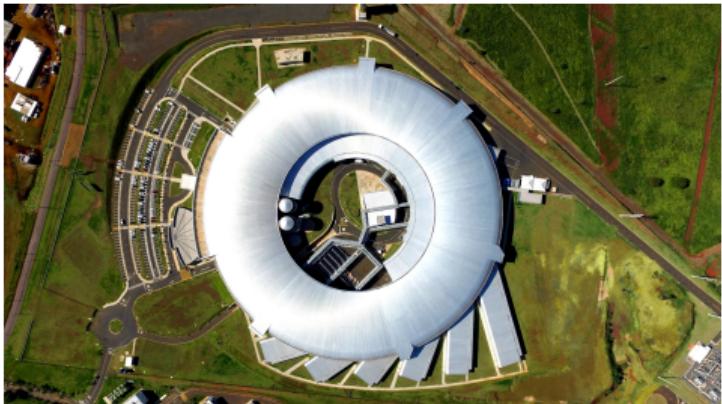
Fast ORM Measurement

Introduction

Online optimization of Dynamic Aperture

Fast ORM Measurement

SIRIUS



- ▶ 4th generation storage ring-based synchrotron light source
- ▶ LINAC, booster, storage ring
- ▶ Storage ring: 518 m in circumf,
3 GeV, nominal energy
- ▶ 100 mA current, top-up injection mode

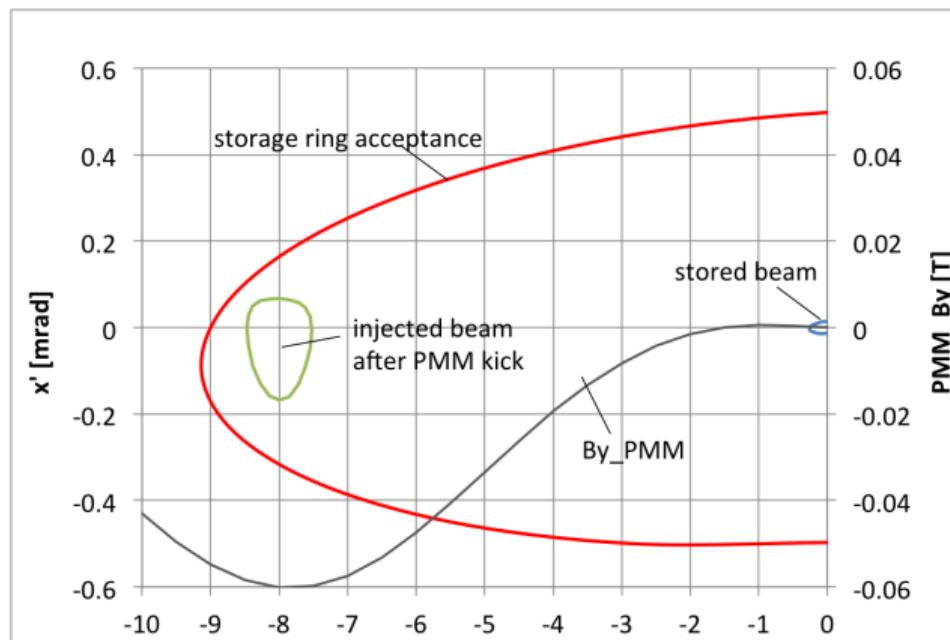
The dissertation problem

Off-axis injection scheme



The dissertation problem

Off-axis injection scheme



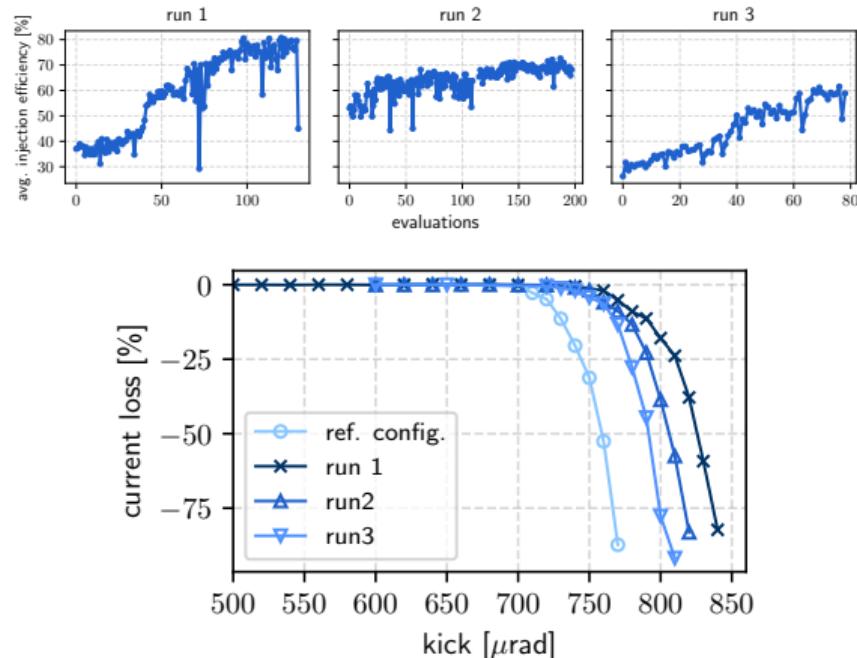
Introduction

Online optimization of Dynamic Aperture

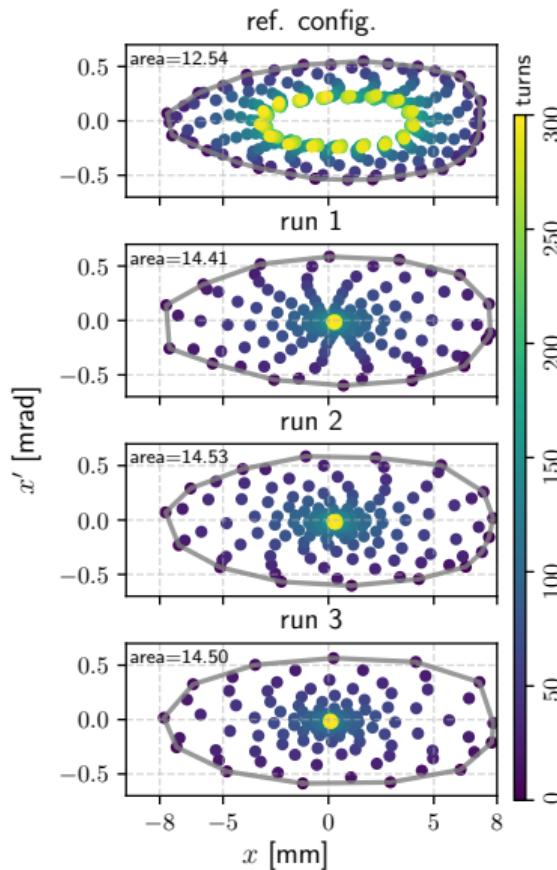
Fast ORM Measurement

SIRIUS Dynamic Aperture Optimization

Working point $\nu_x = 49.08, \nu_y = 14.14$

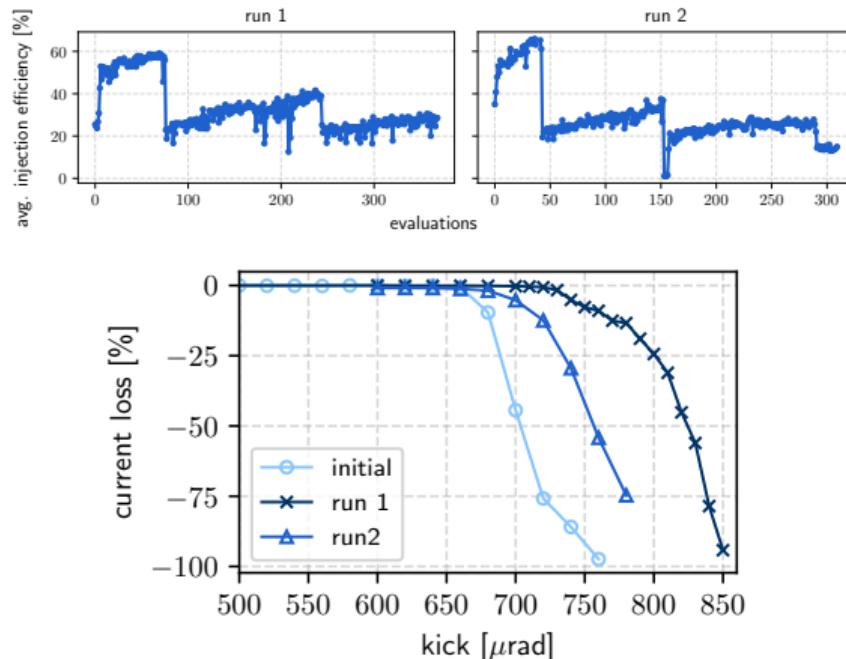


- ▶ injection efficiency: $98 \pm 1\%$ run 2
- ▶ 1 hour reduction in lifetime

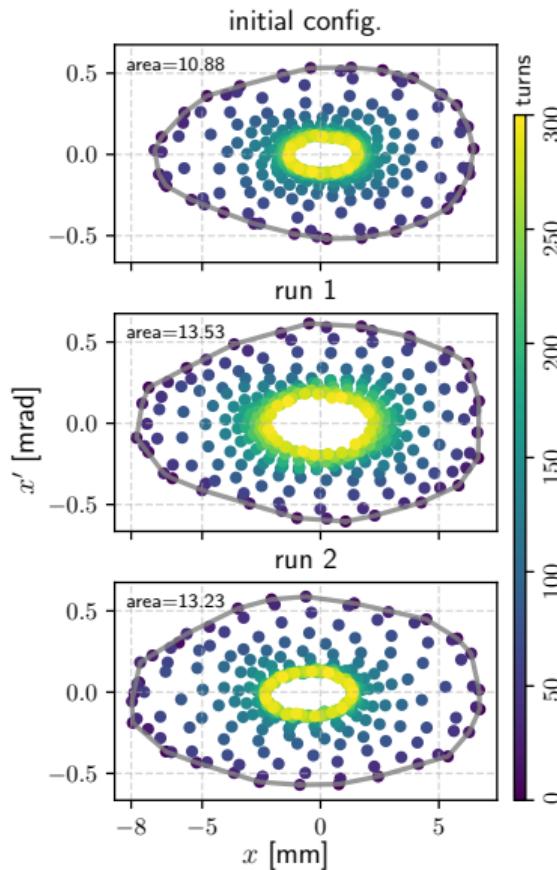


SIRIUS Dynamic Aperture Optimization

Working point $\nu_x = 49.20, \nu_y = 14.25$

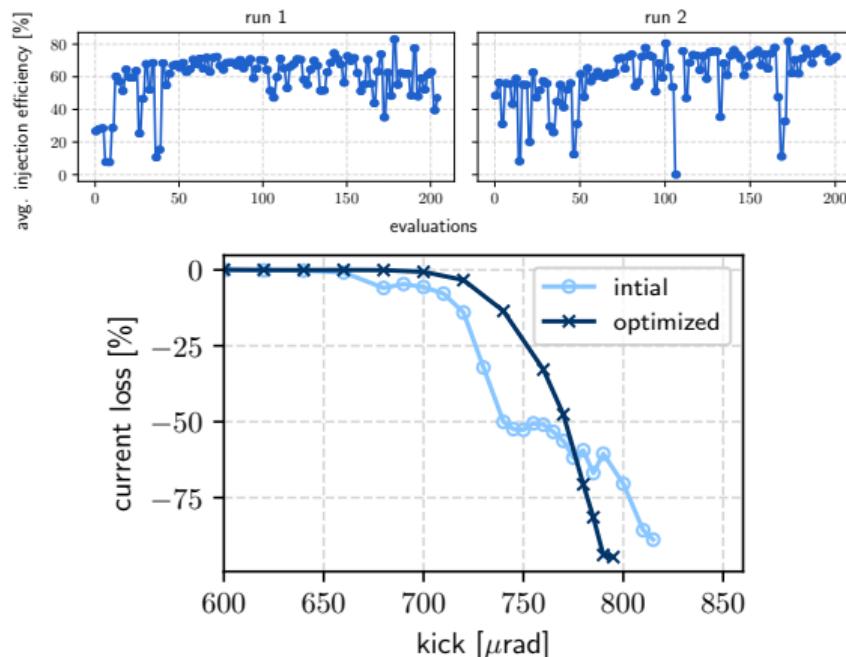


- ▶ injection efficiency: $79 \pm 3\%$ run 1
- ▶ no reduction in lifetime

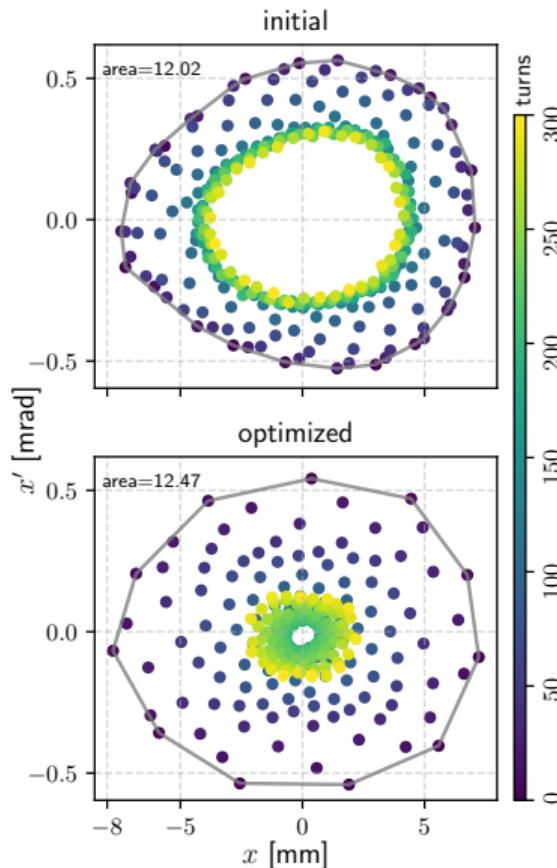


SIRIUS Dynamic Aperture Optimization

Working point $\nu_x = 49.16, \nu_y = 14.22$



- ▶ injection efficiency: $93 \pm 3\%$ run 1
- ▶ 1.5 hr reduction in lifetime



Thank you!

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