OPTIMIZATION AND MODELLING OF STORAGE RING LATTICES: A CASE STUDY OF INDUS-2 STORAGE RING

By

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DECLARATION

I, hereby declare that the investigation presented in the thesis has been carried out by me. The work is original and has not been submitted earlier as a whole or in part for a degree / diploma at this or any other Institution / University.

R. Hun Riyasat Husain

List of Publications arising from the thesis

Journals

- "Measurement, analysis and correction of the closed orbit distortion in Indus-2 synchrotron radiation source", **Riyasat Husain**, A. D. Ghodke, S.Yadav, A. C. Holikatti, R. P. Yadav, P. Fatnani, T. A. Puntambekar and P. R. Hannurkar, *Pramana-J. Phys.*, 2013, 80, 263.
- "Optimal placement of magnets in Indus-2 storage ring", Riyasat Husain, A.D. Ghodke and G. Singh, *Chin. Phys. C*, 2015, *39*, 037002.
- "Analysis and correction of the linear optics errors, and operational improvements in the Indus-2 storage ring", Riyasat Husain and A. D. Ghodke, *Chin. Phys. C*, 2017, 41, 087002
- "Constrained multi-objective optimization of storage ring lattices", Riyasat Husain and A.D. Ghodke, *Nucl. Instrum. Methods Phys. Res. A*, 2018, 883, 151.

Conferences

- "Calibration and restoration of low emittance beam optics in Indus-2 storage ring", Riyasat Husain and A D Ghodke, Indian Particle Accelerator Conference, 2018, Paper ID 244.
- "Indus-2 lattice optimization using multi-objective optimization algorithms", Riyasat Husain and A. D. Ghodke, Indian Particle Accelerator Conference, 2015, Mumbai.
- "Beta beat correction and improvement in Indus-2 storage ring performance", Riyasat Husain, S. K. Jena, V. K. Meena, P. Kant and A. D. Ghodke, Indian Particle Accelerator Conference, 2015, Mumbai.

- 4. "Orbit response matrix analysis in Indus-2 at 2.5 GeV", **Riyasat Husain** and A. D. Ghodke, Indian Particle Accelerator Conference, Nov. 19-22, 2013, Kolkata.
- "Chromaticity measurement during beam energy ramp in Indus-2", Riyasat Husain, D.
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DEDICATIONS

This thesis is dedicated to my parents,

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&

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