String integrability of defect CFT and dynamical reflection matrices

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based on JHEP **05** (2021) 203 [arXiv:2102.12381] with Konstantin Zarembo
and previous work with Charlotte Kristjansen and Marius de Leeuw

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Boundaries and defects

Boundaries and defects arise often in the study of the physical world, simply because real-world systems are imperfect: impurities, domain walls, boundaries, interfaces and defects separate regions with different properties and break many of the underlying symmetries.

Formal aspects

- Holography & the AdS/CFT correspondence
- String theory
- Quantum entanglement

Applied aspects

- Statistical systems near surfaces
- Topological materials such as graphene and topological insulators
- Out-of-equilibrium systems and quantum quenches

Naturally, boundaries and defects permeate all branches of physics, from high-energy and particle physics, to condensed matter, statistical, even gravity and mathematical physics.

Further reading

- This talk is based on my following papers:

[1]. G. Linardopoulos and K. Zarembo. "String integrability of defect CFT and dynamical reflection matrices". In: *JHEP* **05** (2021), p. 203. arXiv: 2102.12381 [hep-th],
[2]. G. Linardopoulos. "Solving holographic defects". In: *PoS* (2020), p. 141. arXiv: 2005.02117 [hep-th],
[3]. M. de Leeuw et al. "Spin chain overlaps and the twisted Yangian". In: *JHEP* **01** (2020), p. 176. arXiv: 1912.09338 [hep-th],
[4]. M. de Leeuw, C. Kristjansen, and G. Linardopoulos. "Scalar one-point functions and matrix product states of AdS/dCFT". In: *Phys. Lett.* **B781** (2018), p. 238. arXiv: 1802.01598 [hep-th],
[5]. M. de Leeuw, C. Kristjansen, and G. Linardopoulos. "One-point functions of non-protected operators in the $SO(5)$ symmetric D3-D7 dCFT". In: *J. Phys.* **A50** (2017), p. 254001. arXiv: 1612.06236 [hep-th].

- See also the following papers:

[6]. A. Karch and L. Randall. "Localized gravity in string theory". In: *Phys. Rev. Lett.* **87** (2001), p. 061601. arXiv: hep-th/0105108 [hep-th],
[7]. A. Dekel and Y. Oz. "Integrability of Green-Schwarz sigma models with boundaries". In: *JHEP* **08** (2011), p. 004. arXiv: 1106.3446 [hep-th].
[8]. P. Liendo, L. Rastelli, and B. C. van Rees. "The bootstrap program for boundary CFT$_d$". In: *JHEP* **07** (2013), p. 113. arXiv: 1210.4258 [hep-th],
[9]. M. de Leeuw, C. Kristjansen, and K. Zarembo. "One-point functions in defect CFT and integrability". In: *JHEP* **08** (2015), p. 098. arXiv: 1506.06958 [hep-th],
[10]. S. Komatsu and Y. Wang. "Non-perturbative defect one-point functions in planar $\mathcal{N} = 4$ super-Yang-Mills". In: (2020). arXiv: 2004.09514 [hep-th],

- Comprehensive reviews of the subject are:

[11]. M. de Leeuw et al. "Introduction to integrability and one-point functions in $\mathcal{N} = 4$ SYM and its defect cousin". In: *Les Houches Lect. Notes* 106 (2019). arXiv: 1708.02525 [hep-th],
[12]. M. de Leeuw. "One-point functions in AdS/dCFT". In: *J. Phys.* **A53** (2020), p. 283001. arXiv: 1908.03444 [hep-th].

Ευχαριστώ!