Notes on Fields

Rafael Cordoba*
(Dated: May 14, 2025)

Minimal notes on Strings, 2d CFTs and QFT. The strings section covers various topics in string theory, including quantization, CFTs, BRST, tree and one loop scattering amplitudes, background fields, superstrings, compactifications, dualities, and AdS/CFT. The 2d CFTs section covers exactly solvable models in 2d CFTs, these include AMM, EMM, GMM and Liouville theory. Topics include representations, fusion, spectrum, BPZ equations, DOZZ and crossing symmetry.

CONTENTS

* Laboratoire de Physique de l'Ecole Normale Supérieure, ENS-Université PSL, F-75005 Paris, France ; rf.cordoba@ens.psl.eu

I. DIFFERENTIAL GEOMETRY AND GAUGE FIELDS

A. Gauge theory

$$FESR_{P1} = \frac{1}{64\pi^5(n+2)}\left(\frac{\alpha_S}{\pi}+1\right)$$

$$FESR_{S0} = \frac{3\left(m_d^2+m_u^2\right)}{64\pi^5(n+2)}\left(\frac{13\alpha_S}{3\pi}+1\right)$$

$$FESR_{D0} = \frac{1}{64\pi^5(n+3)}\left(\frac{11}{10}-\frac{17\alpha_S}{18\pi}\right)$$

$$const_{S0} = \frac{\sqrt{3}}{16\pi^{5/2}}\left(\frac{s-4}{s}\right)^{1/4}$$
$$const_{P1} = \frac{\sqrt{s}}{8\sqrt{6}\pi^{5/2}}\left(\frac{s-4}{s}\right)^{3/4}$$
$$const_{D0} = \frac{s}{16\sqrt{10}\pi^{5/2}}\left(\frac{s-4}{s}\right)^{5/4}$$

[1] S. Ribault, Exactly solvable conformal field theories (2024), arXiv:2411.17262 [hep-th].
[2] G. W. Moore and N. Seiberg, Commun. Math. Phys. **123**, 177 (1989).