Appendix A

Units, numbers and conventions

We will work in natural units in which $\hbar = c = 1$. In these units, all dimensionful quantities have dimensions of mass to some power. One way to convert from mass (g) to length (cm) and time (s), is to remember the values for the Planck mass, time, and length: $m_{\rm P} = 1.2 \times 10^{19}$ GeV, $t_{\rm P} = 5.4 \times 10^{-43}$ s, $l_{\rm P} = 1.6 \times 10^{-33}$ cm. Also, $m_{\rm P} t_{\rm P} = 1 = m_{\rm P} l_{\rm P}$ in natural units. It is also useful to remember $m_{\rm P} = 2.2 \times 10^{-5}$ g and, when dealing with magnetic fields, the conversion: 1 Gauss $= 1.95 \times 10^{-20}$ GeV^2. In addition, for cosmological estimates it is convenient to know that 1 pc $= 3.1 \times 10^{18}$ cm.

The metric signature is taken to be $(+, -, -, -)$.

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