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Chapter 9

Bell inequalities and absolute randomness

In this course, we have come a long way until now. We have discussed the formalism of quantum mechanics, including concepts of quantum states and measurement, we discussed quantum dynamics in several ramifications, encountered spin degrees of freedom, spent a lot of time with rotationally invariant problems, got a good intuition on approximate approaches in perturbation theory. So far, therefore, we have already covered more material than many elementary courses in quantum theory cover. Still, a good course on quantum theory is incomplete without a discussion of Bell inequalities.

9.1 Locality and the historical debate

9.2 Bohm's version of the thought experiment

9.3 Bell's inequalities

9.4 Absolute randomness