Ergänzung zu Übung 5 #4

Nolting 5/2 # 8.2.3

1. $N = 2$:

$$S_2^{(+)} = \frac{1}{2}\left(\mathbf{1}_2 + P_{12}\right) ,$$

$$S_2^{(-)} = \frac{1}{2}\left(\mathbf{1}_2 - P_{12}\right)$$

$$\Rightarrow\ S_2^{(+)} + S_2^{(-)} = \mathbf{1}_2 .$$

$\mathcal{H}_2^{(+)}$ und $\mathcal{H}_2^{(-)}$ bilden offensichtlich den gesamten $\mathcal{H}_2$.

2. $N = 3$:

$$S_3^{(+)} = \frac{1}{6}\left(\mathbf{1}_3 + P_{12} + P_{13} + P_{23} + P_{12}P_{23} + P_{12}P_{13}\right) ,$$

$$S_3^{(-)} = \frac{1}{6}\left(\mathbf{1}_3 - P_{12} - P_{13} - P_{23} + P_{12}P_{23} + P_{12}P_{13}\right)$$

$$\Rightarrow\ S_3^{(+)} + S_3^{(-)} \neq \mathbf{1}_3 .$$

$$\overset{1}{|\alpha\beta\rangle} + \overset{P_{12}}{|\beta\alpha\rangle}$$

$$\overset{1}{|\alpha\beta\rangle} - \overset{P_{12}}{|\beta\alpha\rangle}$$

$$\overset{1}{|\alpha\beta\gamma\rangle} + \overset{P_{12}}{|\beta\alpha\gamma\rangle} + \overset{P_{23}}{|\alpha\gamma\beta\rangle}$$

$$+ \underset{P_{13}}{|\gamma\beta\alpha\rangle} + \underset{P_{12}P_{23}}{|\gamma\alpha\beta\rangle} + \underset{P_{12}P_{13}}{|\beta\gamma\alpha\rangle}$$

$$P_{12}P_{23}|\alpha\beta\gamma\rangle =$$

$$P_{12}|\alpha\gamma\beta\rangle = |\gamma\alpha\beta\rangle$$