

TABLE I. Hamiltonian coefficients for Eq. (1) and parameters for the PEA experiment for each value of R .

R	$\mathbb{1}$	Z_0	Z_1	Z_0Z_1	X_0X_1	Y_0Y_1	t_0	Ordering	Trotter error
0.20	2.8489	0.5678	-1.4508	0.6799	0.0791	0.0791	1.500	$Z_0 \cdot X_0X_1 \cdot Z_1 \cdot Y_0Y_1$	0.0124
0.25	2.1868	0.5449	-1.2870	0.6719	0.0798	0.0798	1.590	$Z_0 \cdot Y_0Y_1 \cdot Z_1 \cdot X_0X_1$	0.0521
0.30	1.7252	0.5215	-1.1458	0.6631	0.0806	0.0806	1.770	$X_0X_1 \cdot Z_0 \cdot Y_0Y_1 \cdot Z_1$	0.0111
0.35	1.3827	0.4982	-1.0226	0.6537	0.0815	0.0815	2.080	$Z_0 \cdot X_0X_1 \cdot Z_1 \cdot Y_0Y_1$	0.0368
0.40	-0.2047	0.4754	-0.9145	0.6438	0.0825	0.0825	2.100	$Z_0 \cdot X_0X_1 \cdot Z_1 \cdot Y_0Y_1$	0.0088
0.45	-0.2677	0.4534	-0.8194	0.6336	0.0835	0.0835	2.310	$X_0X_1 \cdot Z_0 \cdot Y_0Y_1 \cdot Z_1$	0.0141
0.50	-0.3202	0.4325	-0.7355	0.6233	0.0846	0.0846	2.580	$Z_0 \cdot X_0X_1 \cdot Z_1 \cdot Y_0Y_1$	0.0672
0.55	-0.3642	0.4125	-0.6612	0.6129	0.0858	0.0858	2.700	$Z_0 \cdot X_0X_1 \cdot Z_1 \cdot Y_0Y_1$	0.0147
0.60	-0.4012	0.3937	-0.5950	0.6025	0.0870	0.0870	2.250	$Z_0 \cdot X_0X_1 \cdot Z_1 \cdot Y_0Y_1$	0.0167
0.65	-0.4323	0.3760	-0.5358	0.5921	0.0883	0.0883	3.340	$Z_1 \cdot X_0X_1 \cdot Z_0 \cdot Y_0Y_1$	0.0175
0.70	-0.4584	0.3593	-0.4826	0.5818	0.0896	0.0896	0.640	$Z_0 \cdot Y_0Y_1 \cdot Z_1 \cdot X_0X_1$	0.0171
0.75	-0.4804	0.3435	-0.4347	0.5716	0.0910	0.0910	0.740	$Z_0 \cdot Y_0Y_1 \cdot Z_1 \cdot X_0X_1$	0.0199
0.80	-0.4989	0.3288	-0.3915	0.5616	0.0925	0.0925	0.790	$Z_0 \cdot Y_0Y_1 \cdot Z_1 \cdot X_0X_1$	0.0291
0.85	-0.5143	0.3149	-0.3523	0.5518	0.0939	0.0939	3.510	$Z_0 \cdot X_0X_1 \cdot Z_1 \cdot Y_0Y_1$	0.0254
0.90	-0.5271	0.3018	-0.3168	0.5421	0.0954	0.0954	3.330	$Z_0 \cdot X_0X_1 \cdot Z_1 \cdot Y_0Y_1$	0.0283
0.95	-0.5377	0.2895	-0.2845	0.5327	0.0970	0.0970	4.090	$X_0X_1 \cdot Z_0 \cdot Y_0Y_1 \cdot Z_1$	0.0328
1.00	-0.5463	0.2779	-0.2550	0.5235	0.0986	0.0986	4.360	$Z_0 \cdot X_0X_1 \cdot Z_1 \cdot Y_0Y_1$	0.0362
1.05	-0.5533	0.2669	-0.2282	0.5146	0.1002	0.1002	4.650	$Z_1 \cdot X_0X_1 \cdot Z_0 \cdot Y_0Y_1$	0.0405
1.10	-0.5588	0.2565	-0.2036	0.5059	0.1018	0.1018	4.280	$Z_1 \cdot X_0X_1 \cdot Z_0 \cdot Y_0Y_1$	0.0243
1.15	-0.5631	0.2467	-0.1810	0.4974	0.1034	0.1034	5.510	$Z_0 \cdot X_0X_1 \cdot Z_1 \cdot Y_0Y_1$	0.0497
1.20	-0.5663	0.2374	-0.1603	0.4892	0.1050	0.1050	5.950	$Z_0 \cdot Y_0Y_1 \cdot Z_1 \cdot X_0X_1$	0.0559
1.25	-0.5685	0.2286	-0.1413	0.4812	0.1067	0.1067	6.360	$X_0X_1 \cdot Z_1 \cdot Y_0Y_1 \cdot Z_0$	0.0585
1.30	-0.5699	0.2203	-0.1238	0.4735	0.1083	0.1083	0.660	$Z_1 \cdot X_0X_1 \cdot Z_0 \cdot Y_0Y_1$	0.0905
1.35	-0.5706	0.2123	-0.1077	0.4660	0.1100	0.1100	9.810	$Z_0 \cdot X_0X_1 \cdot Z_1 \cdot Y_0Y_1$	0.0694
1.40	-0.5707	0.2048	-0.0929	0.4588	0.1116	0.1116	9.930	$Z_0 \cdot X_0X_1 \cdot Z_1 \cdot Y_0Y_1$	0.0755
1.45	-0.5702	0.1976	-0.0792	0.4518	0.1133	0.1133	5.680	$Y_0Y_1 \cdot Z_0 \cdot X_0X_1 \cdot Z_1$	0.0142
1.50	-0.5693	0.1908	-0.0666	0.4451	0.1149	0.1149	10.200	$Z_1 \cdot X_0X_1 \cdot Z_0 \cdot Y_0Y_1$	0.0885
1.55	-0.5679	0.1843	-0.0549	0.4386	0.1165	0.1165	9.830	$Z_0 \cdot X_0X_1 \cdot Z_1 \cdot Y_0Y_1$	0.0917
1.60	-0.5663	0.1782	-0.0442	0.4323	0.1181	0.1181	8.150	$Z_0 \cdot Y_0Y_1 \cdot Z_1 \cdot X_0X_1$	0.0416
1.65	-0.5643	0.1723	-0.0342	0.4262	0.1196	0.1196	8.240	$X_0X_1 \cdot Z_0 \cdot Y_0Y_1 \cdot Z_1$	0.0488
1.70	-0.5621	0.1667	-0.0251	0.4204	0.1211	0.1211	0.520	$Z_1 \cdot X_0X_1 \cdot Z_0 \cdot Y_0Y_1$	0.0450
1.75	-0.5597	0.1615	-0.0166	0.4148	0.1226	0.1226	0.520	$Z_0 \cdot Y_0Y_1 \cdot Z_1 \cdot X_0X_1$	0.0509
1.80	-0.5571	0.1565	-0.0088	0.4094	0.1241	0.1241	1.010	$Z_0 \cdot X_0X_1 \cdot Z_1 \cdot Y_0Y_1$	0.0663
1.85	-0.5544	0.1517	-0.0015	0.4042	0.1256	0.1256	0.530	$Z_1 \cdot X_0X_1 \cdot Z_0 \cdot Y_0Y_1$	0.0163
1.90	-0.5516	0.1472	0.0052	0.3992	0.1270	0.1270	1.090	$X_0X_1 \cdot Z_0 \cdot Y_0Y_1 \cdot Z_1$	0.0017
1.95	-0.5488	0.1430	0.0114	0.3944	0.1284	0.1284	0.610	$X_0X_1 \cdot Z_1 \cdot Z_0 \cdot Y_0Y_1$	0.0873
2.00	-0.5458	0.1390	0.0171	0.3898	0.1297	0.1297	1.950	$Z_1 \cdot Z_0 \cdot X_0X_1 \cdot Y_0Y_1$	0.0784
2.05	-0.5429	0.1352	0.0223	0.3853	0.1310	0.1310	4.830	$X_0X_1 \cdot Y_0Y_1 \cdot Z_0 \cdot Z_1$	0.0947
2.10	-0.5399	0.1316	0.0272	0.3811	0.1323	0.1323	1.690	$Y_0Y_1 \cdot X_0X_1 \cdot Z_0 \cdot Z_1$	0.0206
2.15	-0.5369	0.1282	0.0317	0.3769	0.1335	0.1335	0.430	$X_0X_1 \cdot Y_0Y_1 \cdot Z_0 \cdot Z_1$	0.0014
2.20	-0.5339	0.1251	0.0359	0.3730	0.1347	0.1347	1.750	$Z_0 \cdot Z_1 \cdot X_0X_1 \cdot Y_0Y_1$	0.0107
2.25	-0.5310	0.1221	0.0397	0.3692	0.1359	0.1359	11.500	$X_0X_1 \cdot Z_1 \cdot Z_0 \cdot Y_0Y_1$	0.0946
2.30	-0.5280	0.1193	0.0432	0.3655	0.1370	0.1370	0.420	$Z_0 \cdot Z_1 \cdot X_0X_1 \cdot Y_0Y_1$	0.0370
2.35	-0.5251	0.1167	0.0465	0.3620	0.1381	0.1381	0.470	$Z_1 \cdot Z_0 \cdot Y_0Y_1 \cdot X_0X_1$	0.0762
2.40	-0.5223	0.1142	0.0495	0.3586	0.1392	0.1392	10.100	$X_0X_1 \cdot Z_1 \cdot Z_0 \cdot Y_0Y_1$	0.0334
2.45	-0.5195	0.1119	0.0523	0.3553	0.1402	0.1402	11.200	$Z_0 \cdot Z_1 \cdot X_0X_1 \cdot Y_0Y_1$	0.0663
2.50	-0.5168	0.1098	0.0549	0.3521	0.1412	0.1412	0.580	$Z_0 \cdot Y_0Y_1 \cdot X_0X_1 \cdot Z_1$	0.0296
2.55	-0.5141	0.1078	0.0572	0.3491	0.1422	0.1422	11.000	$Z_0 \cdot Z_1 \cdot X_0X_1 \cdot Y_0Y_1$	0.0550
2.60	-0.5114	0.1059	0.0594	0.3461	0.1432	0.1432	11.000	$Z_0 \cdot X_0X_1 \cdot Y_0Y_1 \cdot Z_1$	0.0507
2.65	-0.5089	0.1042	0.0614	0.3433	0.1441	0.1441	11.040	$Z_1 \cdot X_0X_1 \cdot Y_0Y_1 \cdot Z_0$	0.0490
2.70	-0.5064	0.1026	0.0632	0.3406	0.1450	0.1450	0.400	$Z_0 \cdot Z_1 \cdot Y_0Y_1 \cdot X_0X_1$	0.0471
2.75	-0.5039	0.1011	0.0649	0.3379	0.1458	0.1458	0.450	$Y_0Y_1 \cdot Z_0 \cdot Z_1 \cdot X_0X_1$	0.0061
2.80	-0.5015	0.0997	0.0665	0.3354	0.1467	0.1467	0.950	$Z_0 \cdot Y_0Y_1 \cdot X_0X_1 \cdot Z_1$	0.0368
2.85	-0.4992	0.0984	0.0679	0.3329	0.1475	0.1475	10.600	$Z_0 \cdot X_0X_1 \cdot Y_0Y_1 \cdot Z_1$	0.0324