Lab En	Theoretical	chi**2	total chi**2	change
0.01	14.55432		34516.56	213.77
0.02	20.09321			
0.03	24.05493			
1	62.24694	35.58		
5	63.98923	20.16		
10	60.32748	11.16		
25	50.72032	0.89		
50	38.39314	58.79		
100	18.56611	467.23		
150	0.91736	1527.22		
200	-16.07757	4114.92		
250	-32.94509	8899.67		
300	-49.86526	11150.02		
350	-66.83914	8230.92		
400	-83.74715			
600	34.94772			
800	3.39313			
1000	0.02176			
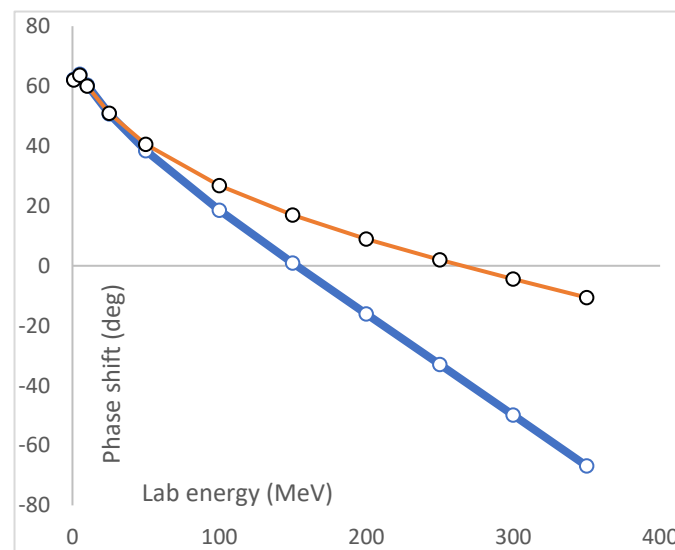
Lab En	Theoretical	chi**2	total chi**2	change
0.01	14.55372		34302.79	-1860.2
0.02	20.09315			
0.03	24.0557			
1	62.31543	68.02		
5	64.16444	44.63		
10	60.5814	31.91		
25	51.11878	1.33		
50	38.91136	33.83		
100	19.13096	405.18		
150	1.4031	1436.02		
200	-15.73571	4003.23		
250	-32.78163	8816.52		
300	-49.89572	11164.98		
350	-67.06494	8297.14		
400	-84.15776			
600	34.14163			
800	3.10754			
1000	0.01711			
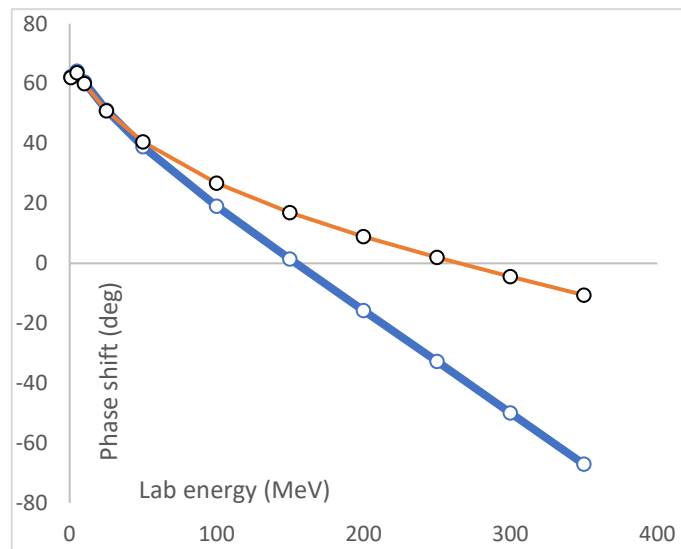
Lab En	Theoretical	chi**2	total chi**2	change
0.01	14.55529		31781.68	-4381.3
0.02	20.09618			
0.03	24.06029			
1	62.40937	129.48		
5	64.40188	93.09		
10	60.93042	77.83		
25	51.69557	17.53		
50	39.73657	8.23		
100	20.25879	294.5		
150	2.70852	1204.85		
200	-14.32358	3558.15		
250	-31.3113	8086.05		
300	-48.40452	10444.14		
350	-65.58447	7867.83		
400	-82.71707			
600	35.12507			
800	3.31377			
1000	0.01933			
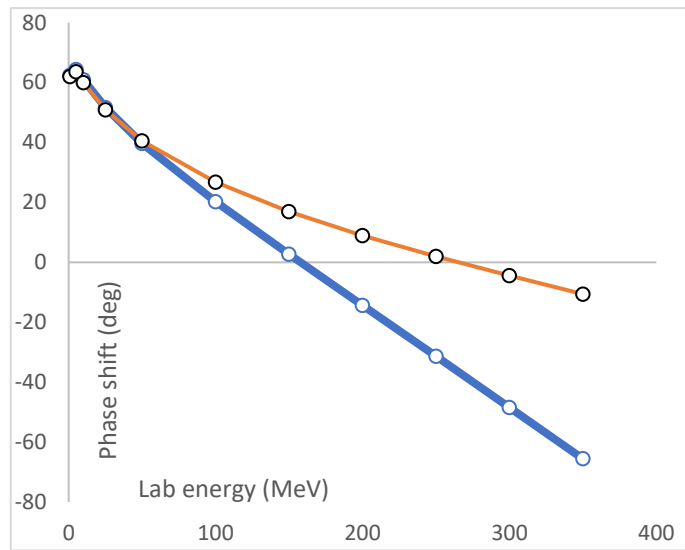
Lab En	Theoretical	chi**2	total chi**2	change
			39860.95	3698
0.01	14.55172			
0.02	20.08803			
0.03	24.04699			
1	62.07789	0.11		
5	63.56163	0.73		
10	59.69884	5.64		
25	49.67978	41.25		
50	36.89844	169.14		
100	16.50772	730.75		
150	-1.47637	2017.63		
200	-18.67037	5012.05		
250	-35.63917	10326.5		
300	-52.58296	12524.71		
350	-69.51428	9032.44		
400	-86.32021			
600	33.3204			
800	3.0874			
1000	0.01877			
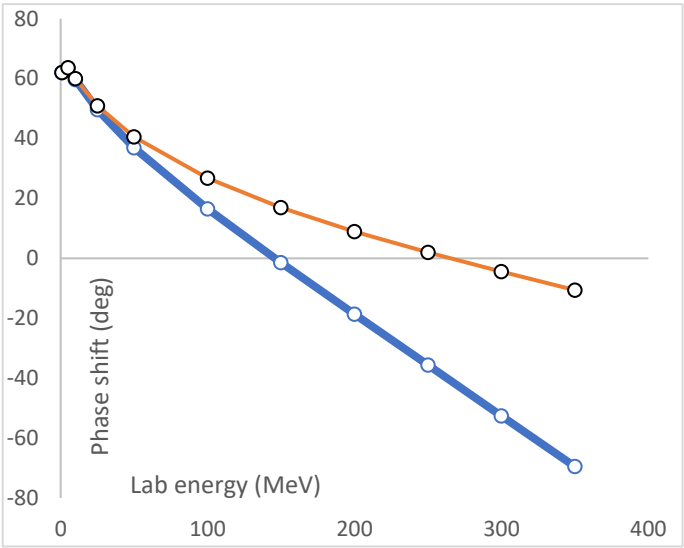
Lab Er	Theoretical	chi**2	total chi**2	change
0.01	14.5519		39384.33	3221.4
0.02	20.08844			
0.03	24.04764			
1	62.09416	0.76		
5	63.60286	0.12		
10	59.75931	3.33		
25	49.77906	34.81		
50	37.03915	156.33		
100	16.69629	704.16		
150	-1.26323	1971.19		
200	-18.44637	4931.05		
250	-35.41382	10203.09		
300	-52.36344	12410.71		
350	-69.30628	8968.78		
400	-86.12835			
600	33.41692			
800	3.09874			
1000	0.01877			
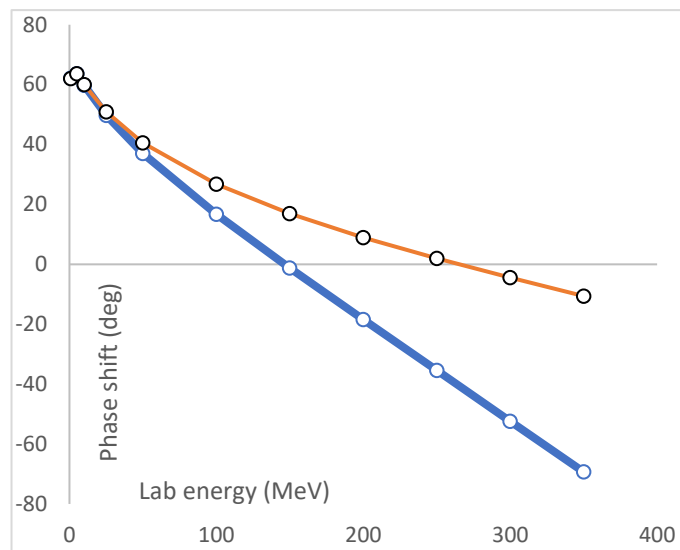
Lab Er	Theoretical	chi**2	total chi**2	change
0.01	14.55319		39781.16	3618.2
0.02	20.08992			
0.03	24.04908			
1	62.07417	0.04		
5	63.54852	1.04		
10	59.67937	6.51		
25	49.64949	43.32		
50	36.8611	172.63		
100	16.47469	735.45		
150	-1.49189	2021.03		
200	-18.6607	5008.54		
250	-35.59967	10304.81		
300	-52.51119	12487.38		
350	-69.40971	9000.41		
400	-86.18425			
600	33.5197			
800	3.15818			
1000	0.0201			
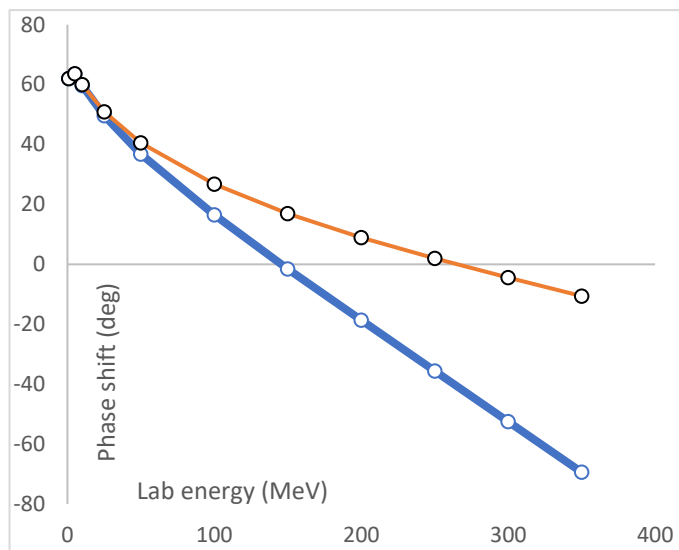
Lab Er	Theoretical	chi**2	total chi**2	change
			35777.04	-385.92
0.01	14.55247			
0.02	20.09049			
0.03	24.05149			
1	62.21811	25.03		
5	63.91933	13.08		
10	60.22424	5.77		
25	50.5444	3.5		
50	38.12739	74.24		
100	18.16414	514.08		
150	0.4084	1625.78		
200	-16.67366	4313.34		
250	-33.61112	9242.55		
300	-50.58464	11506.12		
350	-67.59478	8453.55		
400	-84.52079			
600	34.32652			
800	3.24278			
1000	0.01976			
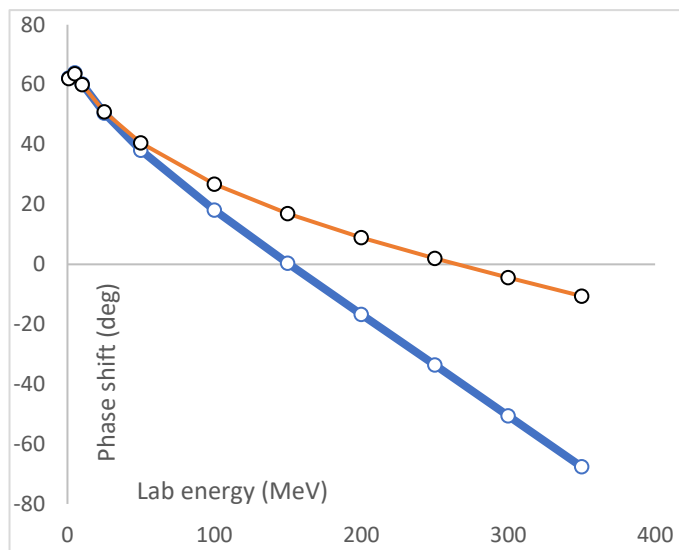
Lab Er	Theoretical	chi**2	total chi**2	change
0.01	14.55284		33347.66	-2815.3
0.02	20.09189			
0.03	24.05415			
1	62.30605	62.96		
5	64.1443	41.33		
10	60.55517	29.28		
25	51.09079	1.01		
50	38.90723	34		
100	19.22293	395.49		
150	1.62208	1395.83		
200	-15.37767	3887.9		
250	-32.28342	8565.46		
300	-49.26405	10856.69		
350	-66.31317	8077.71		
400	-83.30569			
600	35.04818			
800	3.36705			
1000	0.02077			
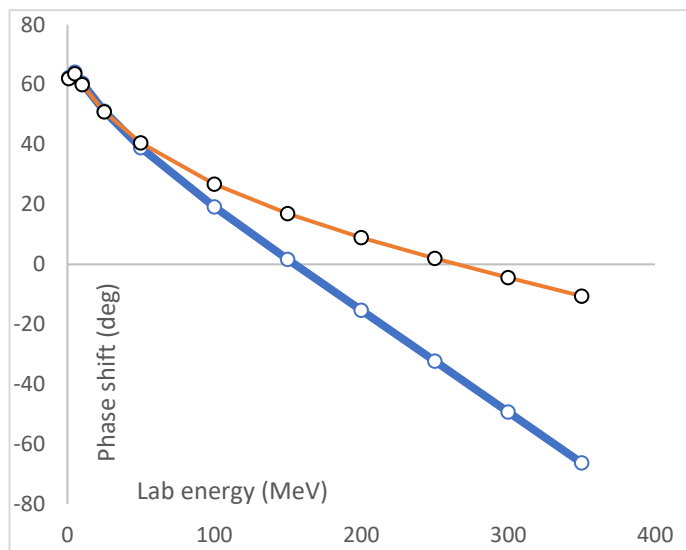
Lab Er	Theoretical	chi**2		total chi**2	change
				37851.17	1688.2
0.01	14.55377				
0.02	20.09125				
0.03	24.05127				
1	62.12852	4.07			
5	63.68671	0.5			
10	59.8828	0.49			
25	49.98732	23.07			
50	37.34918	129.86			
100	17.15532	641.51			
150	-0.68968	1848.93			
200	-17.77937	4693.79			
250	-34.67007	9801.04			
300	-51.55839	11997.07			
350	-68.45577	8710.84			
400	-85.24985				
600	34.16618				
800	3.29798				
1000	0.02191				
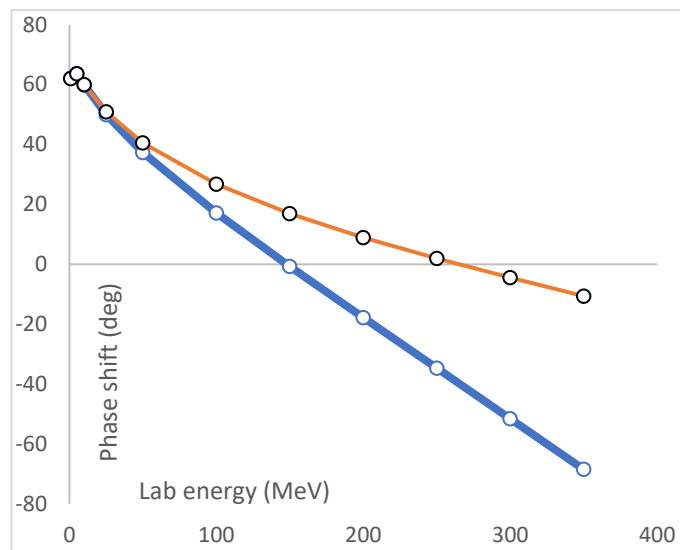
Lab Er	Theoretical	chi**2	total chi**2	change
0.01	14.55462		28576.22	-7586.7
0.02	20.09552			
0.03	24.05979			
1	62.43078	146.23		
5	64.46331	108.5		
10	61.02968	94.56		
25	51.90148	27.78		
50	40.12772	2.17		
100	21.04454	227.81		
150	3.88931	1013.21		
200	-12.77371	3099.84		
250	-29.43516	7199.82		
300	-46.25664	9448.13		
350	-63.2286	7208.17		
400	-80.22521			
600	37.2721			
800	3.85074			
1000	0.02624			

Phase shift (deg) vs Lab energy (MeV)
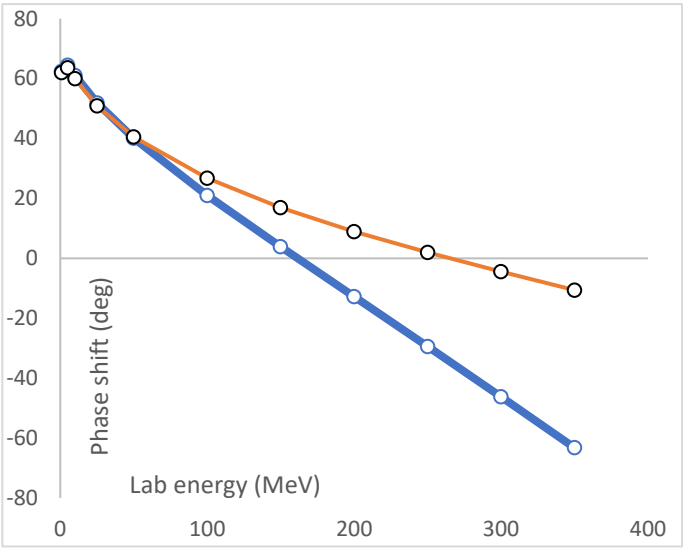
Lab Er	Theoretical	chi**2	total chi**2	change
0.01	14.55309		27532.72	-8630.2
0.02	20.09415			
0.03	24.05896			
1	62.49101	198.82		
5	64.62177	153.69		
10	61.2629	140.29		
25	52.2831	52.99		
50	40.66128	0.19		
100	21.73623	176.17		
150	4.64431	899.37		
200	-12.00721	2884.85		
250	-28.6894	6861.84		
300	-45.55281	9132.61		
350	-62.581	7031.9		
400	-79.64353			
600	37.5483			
800	3.88797			
1000	0.0264			
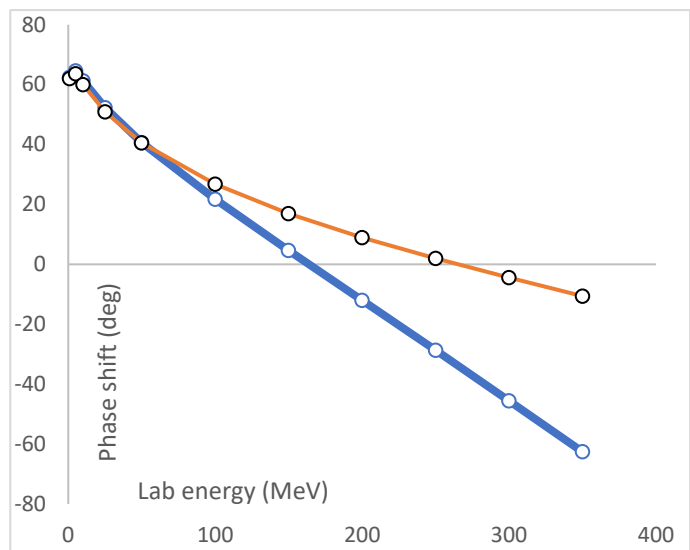
Lab Er	Theoretical	chi**2	total chi**2	change
0.01	14.55403		32444.25	-3718.7
0.02	20.09364			
0.03	24.05638			
1	62.32522	73.52		
5	64.19152	49.27		
10	60.62607	36.66		
25	51.21668	2.78		
50	39.10748	26.18		
100	19.54413	362.59		
150	2.03636	1321.35		
200	-14.89734	3735.83		
250	-31.76411	8307.64		
300	-48.73226	10600.5		
350	-65.79413	7927.93		
400	-82.82259			
600	35.23179			
800	3.347			
1000	0.01956			
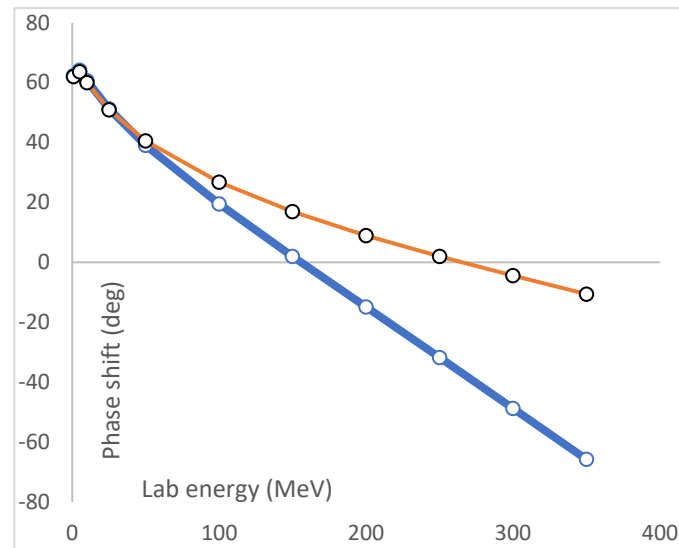
Lab Er	Theoretical	chi**2	total chi**2	change
0.01	14.55242		38768.08	2605.1
0.02	20.08892			
0.03	24.04795			
1	62.07427	0.04		
5	63.55188	0.95		
10	59.68675	6.17		
25	49.67243	41.74		
50	36.91924	167.22		
100	16.6253	714.11		
150	-1.23233	1964.51		
200	-18.28521	4873.19		
250	-35.10808	10036.83		
300	-51.90906	12176.38		
350	-68.70798	8786.94		
400	-85.39936			
600	34.342			
800	3.40533			
1000	0.02459			
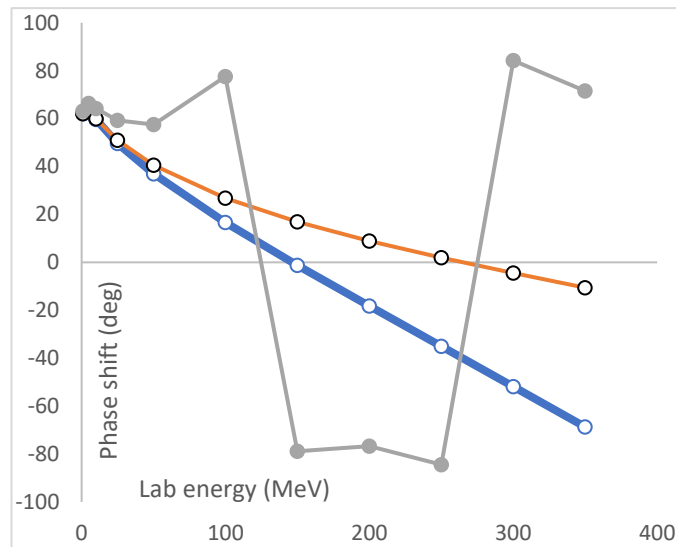
Lab Er	Theoretical	chi**2		total chi**2	change
				38646.29	2483.3
0.01	14.55156				
0.02	20.08804				
0.03	24.04723				
1	62.09774	0.98			
5	63.6136	0.04			
10	59.77647	2.78			
25	49.81359	32.7			
50	37.10341	150.64			
100	16.8267	686.07			
150	-1.06	1927.42			
200	-18.16684	4830.91			
250	-35.05749	10009.46			
300	-51.93268	12188.51			
350	-68.80658	8816.78			
400	-85.5688				
600	34.02484				
800	3.29048				
1000	0.02227				
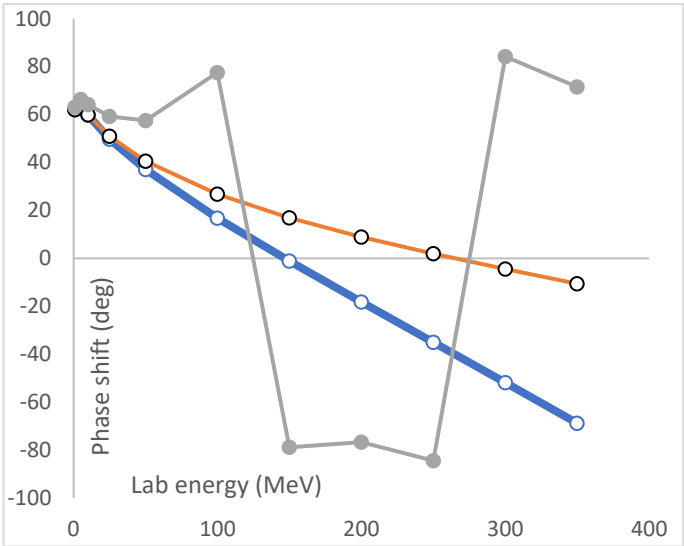
Lab Er	Theoretical	chi**2	total chi**2	change
0.01	14.55239		39383.1	3220.1
0.02	20.08878			
0.03	24.04768			
1	62.06529	0.01		
5	63.52849	1.61		
10	59.65153	7.86		
25	49.61012	46.09		
50	36.82035	176.48		
100	16.46394	736.99		
150	-1.44784	2011.38		
200	-18.547	4967.36		
250	-35.40736	10199.56		
300	-52.23589	12344.7		
350	-69.05131	8891.06		
400	-85.74717			
600	34.10512			
800	3.37233			
1000	0.02494			
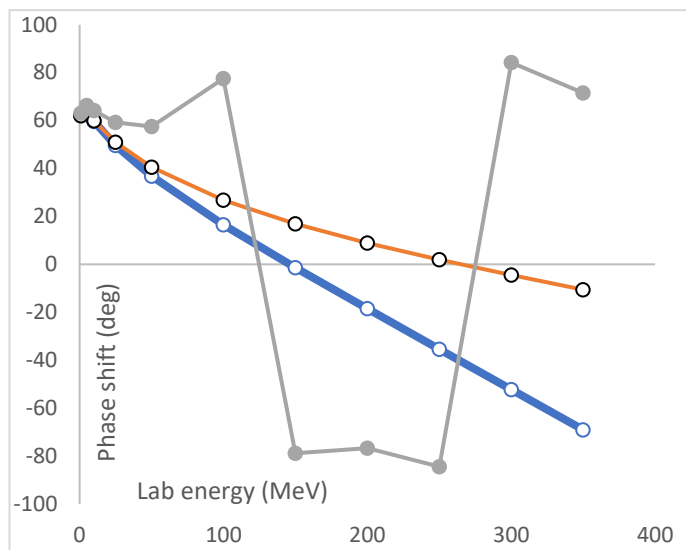
Lab Er	Theoretical	chi**2	total chi**2	change
0.01	14.55005		43604.39	7441.4
0.02	20.08429			
0.03	24.04092			
1	61.92963	21.27		
5	63.18686	30.68		
10	59.15066	54.14		
25	48.78646	123.74		
50	35.64843	305.2		
100	14.88186	980.37		
150	-3.24479	2423.71		
200	-20.43829	5674.45		
250	-37.30468	11261.62		
300	-54.06901	13310.19		
350	-70.76201	9419.02		
400	-87.28648			
600	33.54846			
800	3.44764			
1000	0.03463			
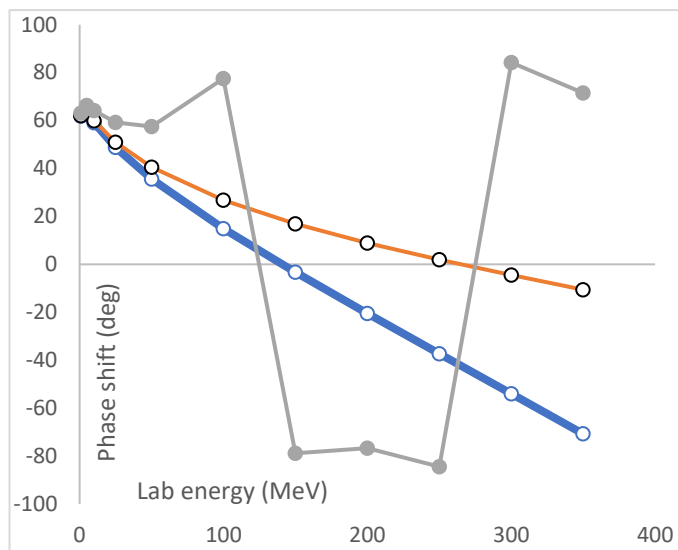
Lab Er	Theoretical	chi**2	total chi**2	change
			44929.08	8766.1
0.01	14.5502			
0.02	20.08394			
0.03	24.03988			
1	61.87689	40.58		
5	63.05164	52.27		
10	58.95253	83.88		
25	48.46317	164.49		
50	35.19567	364.31		
100	14.29447	1079.56		
150	-3.87657	2577.81		
200	-21.05425	5914.89		
250	-37.85756	11581		
300	-54.51917	13552.84		
350	-71.07559	9517.45		
400	-87.43534			
600	34.14672			
800	4.01851			
1000	-1.42145			
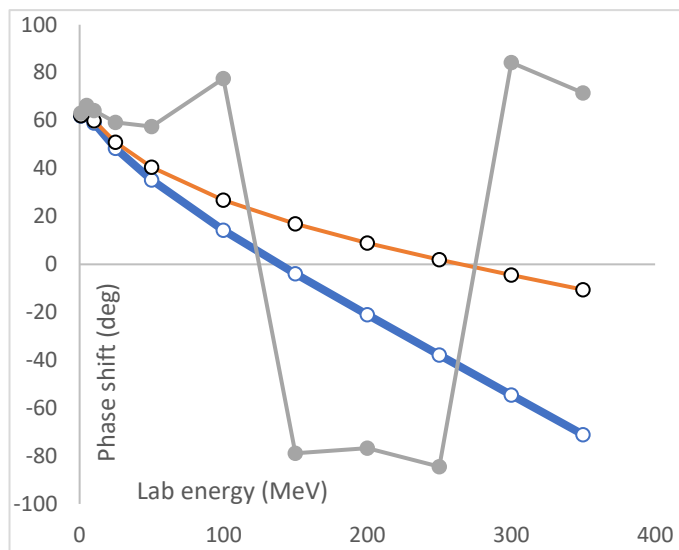
Lab Er	Theoretical	chi**2	total chi**2	change
0.01	14.55		46358.57	10196
0.02	20.08317			
0.03	24.03841			
1	61.82859	63.69		
5	62.92852	76.89		
10	58.77194	116.65		
25	48.16675	206.94		
50	34.77571	423.81		
100	13.73517	1178.45		
150	-4.49648	2733.63		
200	-21.6804	6164.42		
250	-38.44472	11925.07		
300	-55.02637	13828.87		
350	-71.46426	9640.15		
400	-87.66893			
600	34.7909			
800	5.13713			
1000	-0.02076			
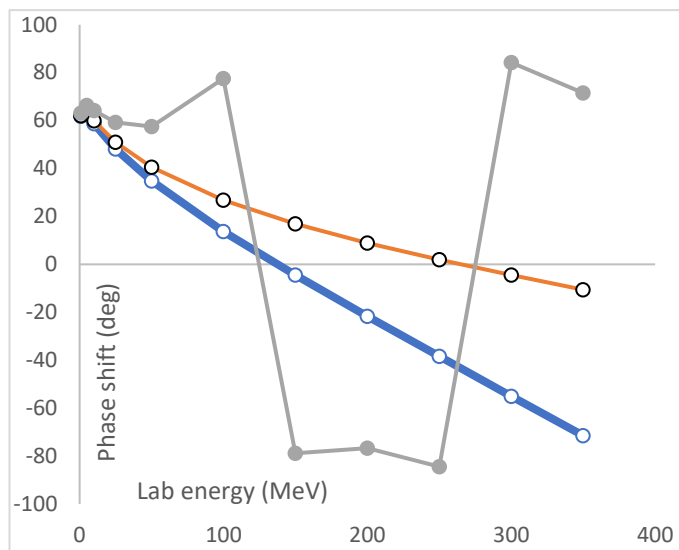
Lab Er	Theoretical	chi**2	total chi**2	change
			39081	2918
0.01	14.54605			
0.02	20.07314			
0.03	24.02135			
1	61.36796	544.5		
5	61.76298	544.65		
10	57.06805	691.19		
25	45.39135	840.59		
50	30.8988	1185.62		
100	8.8332	2230.52		
150	-9.27847	4089.28		
200	-24.98901	7568.56		
250	-37.93121	11623.87		
300	-44.87291	8832.9		
350	-29.49052	929.32		
400	24.0073			
600	15.59171			
800	0.73901			
1000	0.00168			
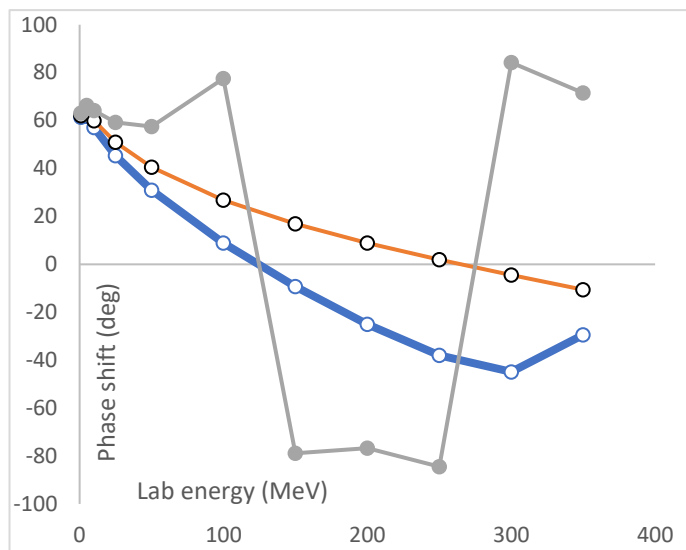
Lab En	Theoretical	chi**2	total chi**2	change
0.01	14.54727		24517.73	-11645
0.02	20.0756			
0.03	24.02516			
1	61.45052	423.65		
5	61.97495	428		
10	57.3863	547.43		
25	45.95703	676.81		
50	31.82851	967.98		
100	10.58844	1815.56		
150	-6.27087	3204.9		
200	-19.64227	5371.11		
250	-26.99851	6125.61		
300	-15.6863	681.61		
350	29.9481	4275.07		
400	45.85312			
600	15.72011			
800	0.71732			
1000	0.00156			
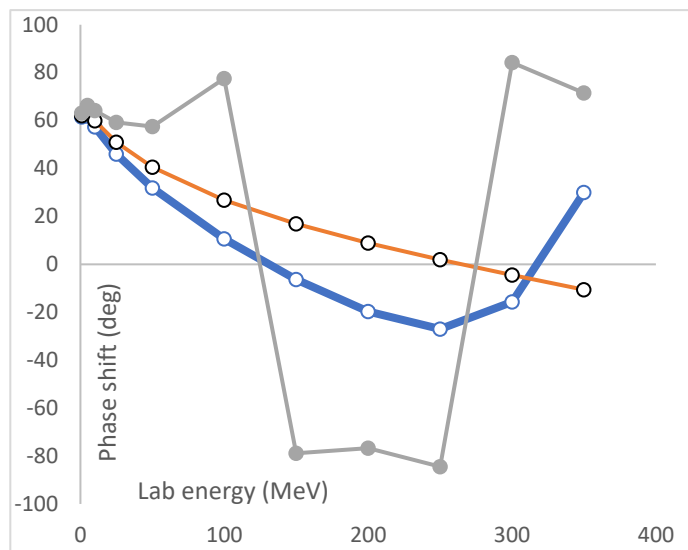
Lab Er	Theoretical	chi**2	total chi**2	change
0.01	14.56106		244707.67	208545
0.02	20.11079			
0.03	24.08513			
1	63.1045	1193.7		
5	66.36005	1164.56		
10	64.17694	1469.63		
25	59.18701	1902.34		
50	57.532	3682.76		
100	77.52988	17836.22		
150	-78.87804	54616.88		
200	-76.7359	48260.09		
250	-84.44479	54534.6		
300	84.21763	42529.6		
350	71.4688	17517.29		
400	58.34467			
600	14.42939			
800	0.51852			
1000	0.00064			
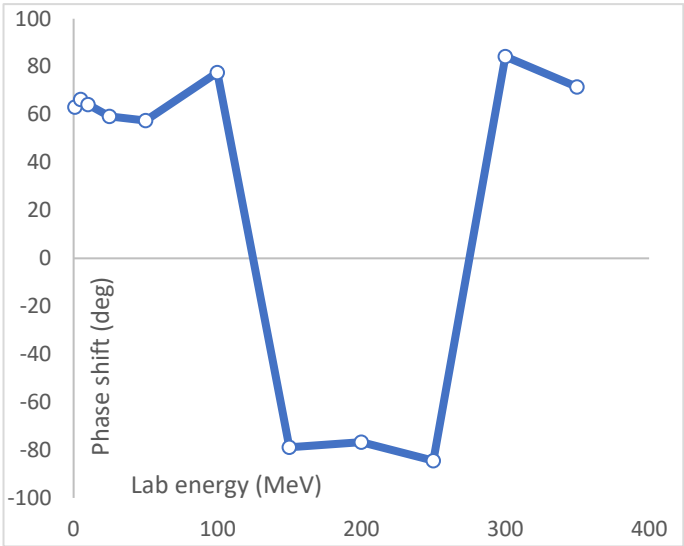
Lab En	Theoretical	chi**2	total chi**2	change
0.01	14.54568		69260.15	33097
0.02	20.07149			
0.03	24.01813			
1	61.25757	729.77		
5	61.47726	724.11		
10	56.64032	910.76		
25	44.64046	1085.37		
50	29.69339	1500.62		
100	6.68734	2795.81		
150	-12.66298	5213.18		
200	-30.29838	10122.62		
250	-46.78296	17354.83		
300	-62.05204	17938.58		
350	-75.27386	10884.5		
400	-83.1429			
600	14.33488			
800	0.77061			
1000	0.00189			
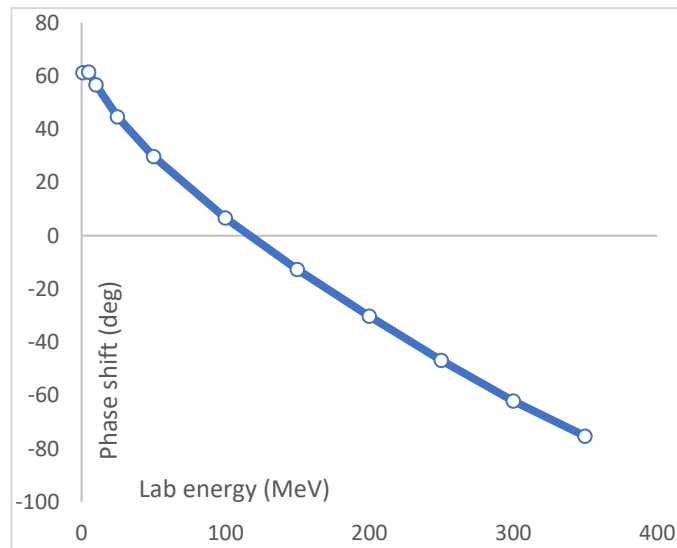
Lab En	Theoretical	chi**2	total chi**2	change
			66992.09	30829
0.01	14.54531			
0.02	20.07137			
0.03	24.01842			
1	61.29274	667.82		
5	61.56876	663.86		
10	56.77601	837.84		
25	44.87075	1006.98		
50	30.04051	1406.11		
100	7.21778	2650.14		
150	-11.98024	4975.49		
200	-29.49405	9711.87		
250	-45.91992	16745.71		
300	-61.29969	17472.96		
350	-75.18113	10853.31		
400	-86.12845			
600	8.2574			
800	0.59314			
1000	0.00139			
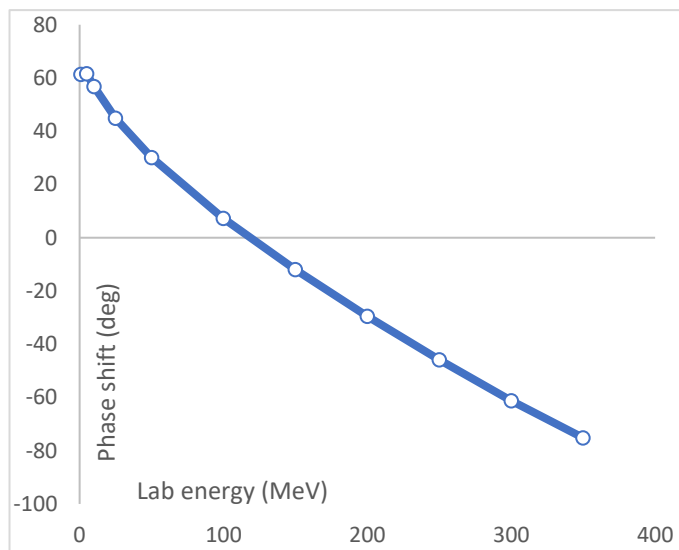
Lab En	Theoretical	chi**2	total chi**2	change
0.01	14.54392		71011.61	34849
0.02	20.06944			
0.03	24.0161			
1	61.2822	686.09		
5	61.54465	679.48		
10	56.73982	856.99		
25	44.80389	1029.43		
50	29.92292	1437.79		
100	6.97299	2716.88		
150	-12.41356	5125.71		
200	-30.21953	10081.98		
250	-47.11783	17594.11		
300	-63.30835	18729.73		
350	-78.71505	12073.42		
400	86.99395			
600	-50.12795			
800	0.30307			
1000	0.00084			
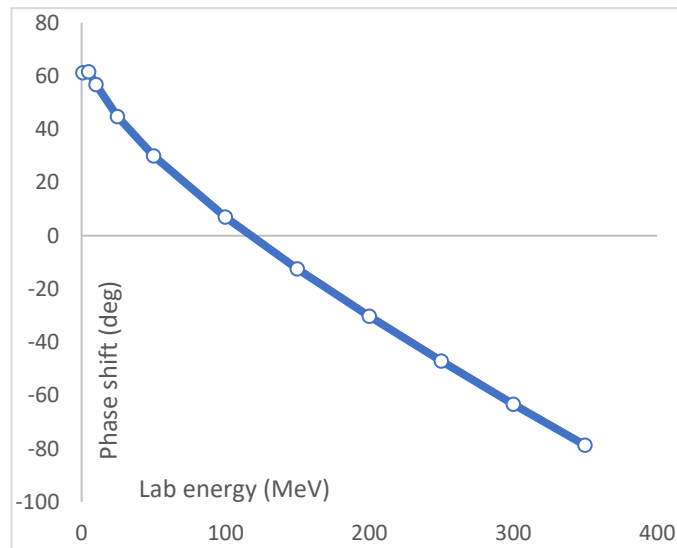
Lab Er	Theoretical	chi**2	total chi**2	change
0.01	14.54755		58406.72	22244
0.02	20.07708			
0.03	24.02815			
1	61.55582	291.47		
5	62.23555	303.83		
10	57.75343	402.39		
25	46.47935	541.33		
50	32.33889	857.88		
100	10.33345	1873.19		
150	-8.49904	3849.76		
200	-26.04631	8047.61		
250	-42.98118	14753.17		
300	-59.55727	16418.11		
350	-75.81677	11067.98		
400	88.33421			
600	34.1934			
800	-33.78944			
1000	-0.0022			

Phase shift (deg) vs Lab energy (MeV)
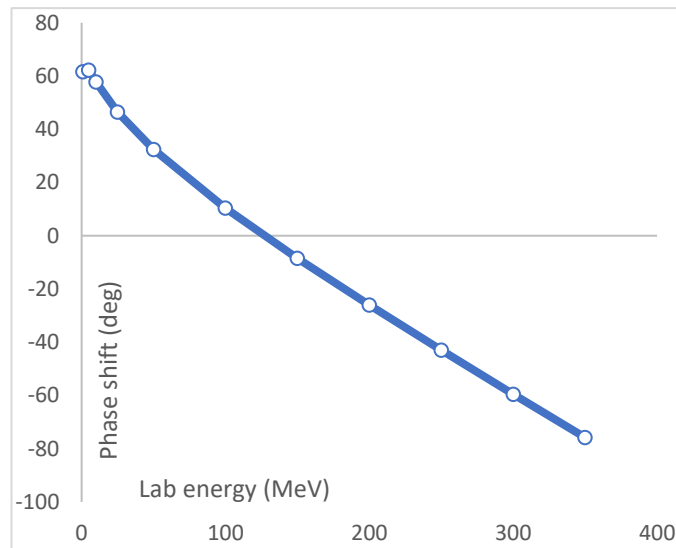
Lab Er	Theoretical	chi**2		total chi**2	change
0.01	14.55447			36162.96	776.29
0.02	20.09277				
0.03	24.05369				
1	62.18572	15.4			
5	63.83178	6.36			
10	60.09603	1.53			
25	50.33962	8.7			
50	37.85329	92.07			
100	17.84259	553.17			
150	0.0989	1687.23			
200	-16.93978	4403.44			
250	-33.8163	9349.48			
300	-50.71976	11573.64			
350	-67.65679	8471.95			
400	-84.51146				
600	34.51837				
800	3.32249				
1000	0.0212				
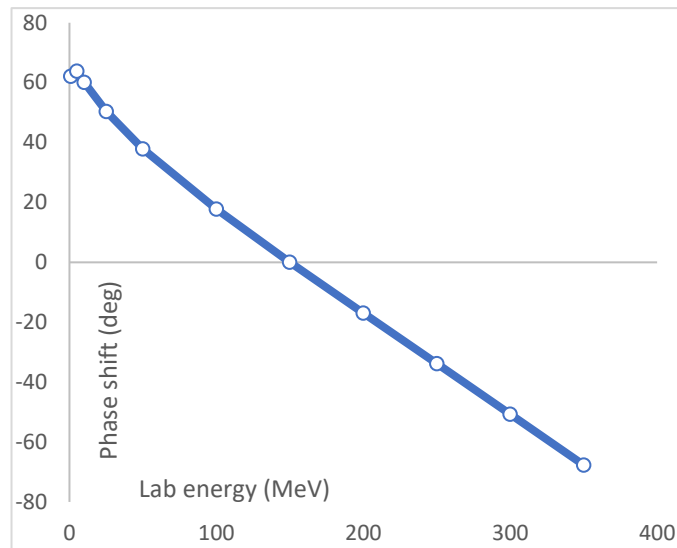
Lab En	Theoretical	chi**2		total chi**2	change
0.01	14.55485			35231.08	-155.59
0.02	20.0937				
0.03	24.05525				
1	62.22716	28.15			
5	63.93688	14.71			
10	60.2499	6.95			
25	50.59051	2.65			
50	38.20417	69.59			
100	18.29917	498.09			
150	0.5986	1588.59			
200	-16.43272	4232.58			
250	-33.32544	9094.68			
300	-50.26159	11345.52			
350	-67.2431	8349.57			
400	-84.15055				
600	34.6415				
800	3.31867				
1000	0.02071				

Phase shift (deg) vs Lab energy (MeV)
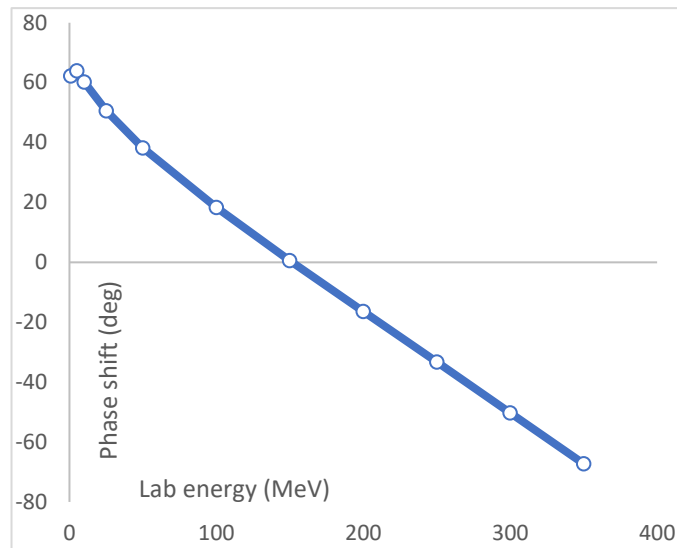
Lab En	Theoretical	chi**2	total chi**2	change
			70751.27	35365
0.01	14.54403			
0.02	20.06584			
0.03	24.00765			
1	60.92919	1440.99		
5	60.64622	1391.08		
10	55.42821	1697.28		
25	42.6775	1872.84		
50	26.98489	2343.64		
100	3.52294	3745.78		
150	-14.63741	5931.79		
200	-26.67243	8338.23		
250	-10.01893	1048.17		
300	66.48673	27222.49		
350	67.1427	15718.97		
400	55.91763			
600	11.19141			
800	-0.04151			
1000	-0.00259			
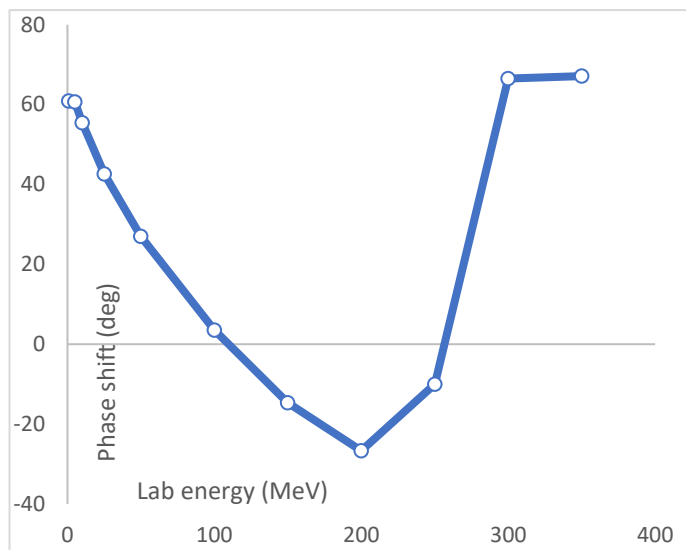
Lab En	Theoretical	chi**2	total chi**2	change
0.01	14.55598		32300	-3086.7
0.02	20.09688			
0.03	24.06086			
1	62.39061	115.64		
5	64.35182	81.41		
10	60.85633	66.4		
25	51.57265	12.53		
50	39.56056	12.24		
100	20.01831	316.62		
150	2.43035	1252.41		
200	-14.62436	3650.75		
250	-31.62444	8238.97		
300	-48.72215	10595.66		
350	-65.89996	7958.35		
400	-83.02433			
600	34.91369			
800	3.26842			
1000	0.01882			
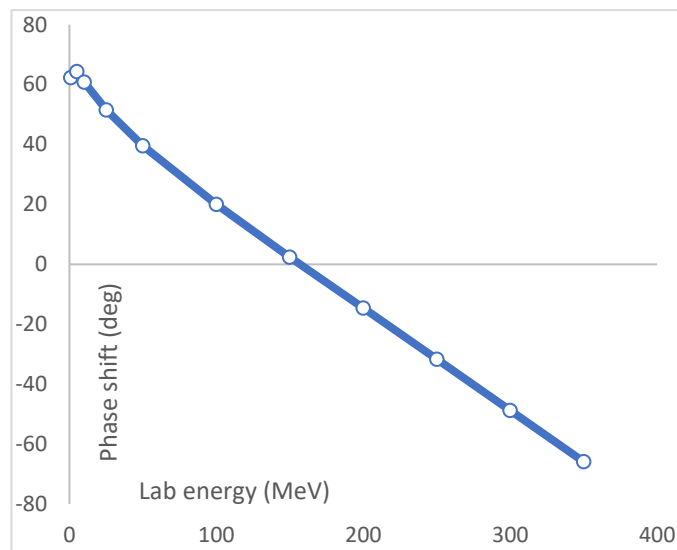
Lab En	Theoretical	chi**2	total chi**2	change
0.01	14.55789		13958.42	-21428
0.02	20.1039			
0.03	24.07407			
1	62.75372	522.46		
5	64.74183	193.15		
10	60.80546	59.07		
25	49.98284	23.3		
50	36.08881	252.72		
100	15.10304	944.26		
150	-1.40967	2003.04		
200	-14.40911	3584.36		
250	-22.07511	4219.77		
300	-17.15914	872.19		
350	11.62726	1284.1		
400	33.69919			
600	14.29511			
800	0.65094			
1000	0.00139			