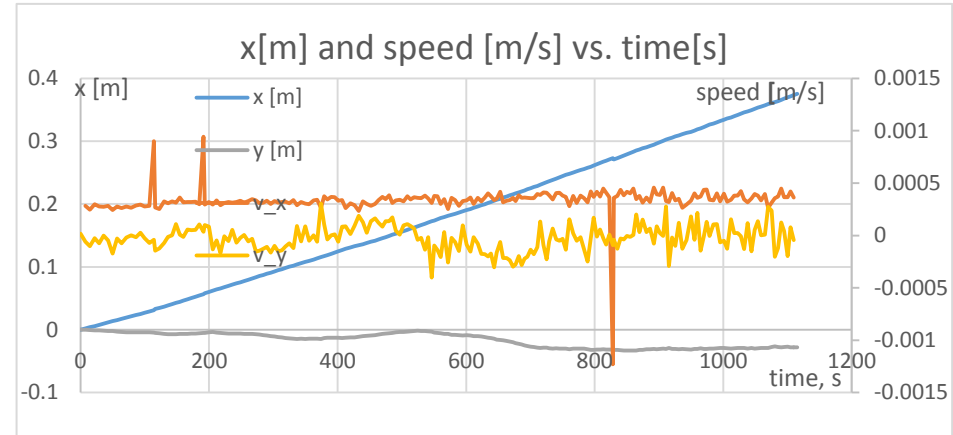


Particle dynamics in tissue

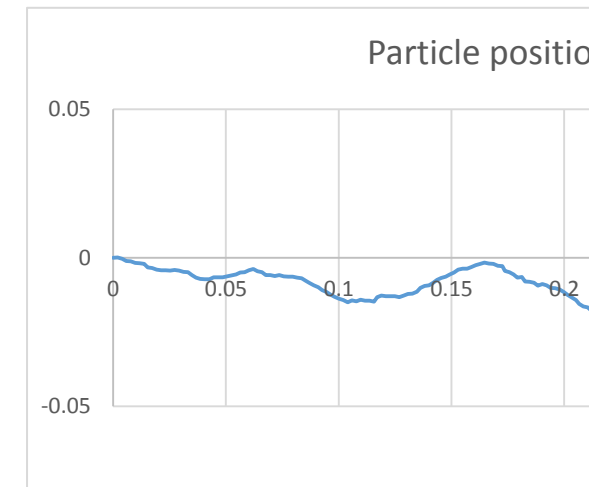
This script simulates a set of static problems. Inertia is ignored

Initial values

Tissue/fluid ratio	1000
saline density	1127 kg/m ³
particle diameter	1.5E-08 m
particle density	8900 kg/m ³
Drag coefficient (sphere)	0.47
particle mass	1.57E-20 kg
initTime	0
step length	0.002 m
Number of steps	200



time	Position		Magnetic force [N]		Velocity [m/s]	
	x [m]	y [m]	Fx	Fy	v_x	v_y
0	0	0	3.20E-18	2.18101E-19	0.000261	1.78E-05
7.638020335	0.001995375	0.000136	3.833E-18	-8.0511E-19	0.000283	-5.9E-05
14.55139692	0.00395267	-0.000275	3.096E-18	-1.2661E-18	0.000247	-0.0001
22.03211373	0.005803905	-0.001032	4.133E-18	-3.47E-19	0.000297	-2.5E-05
28.75030733	0.007796894	-0.001199	3.746E-18	-1.0164E-18	0.000278	-7.5E-05
35.69556647	0.009727095	-0.001723	3.482E-18	-3.2799E-20	0.000273	-2.6E-06
43.02774477	0.011727007	-0.001742	3.769E-18	-6.1518E-19	0.000282	-4.6E-05
50.02895567	0.013700891	-0.002064	3.357E-18	-2.3808E-18	0.000242	-0.00017
56.77345394	0.015332268	-0.003221	3.64E-18	-3.8669E-19	2.78E-04	-3E-05
63.92469877	0.017321079	-0.003432	3.313E-18	-9.547E-19	0.000261	-7.5E-05
71.29375753	0.019242859	-0.003986	3.574E-18	-2.7E-19	0.000276	-2.1E-05
78.52131269	0.021237175	-0.004137	3.272E-18	2.12096E-20	0.000264	1.71E-06
86.08525771	0.023237133	-0.004124	3.802E-18	-2.3653E-19	0.000285	-1.8E-05
93.09582466	0.025233274	-0.004248	4.062E-18	3.6002E-19	0.000294	2.61E-05
99.87110259	0.027225465	-0.004072	3.594E-18	-3.1535E-19	0.000277	-2.4E-05
107.0741485	0.029217812	-0.004246	3.873E-18	-9.903E-19	0.000283	-7.2E-05
113.917378	0.031155475	-0.004742	3.798E-17	-1.7683E-18	0.0009	-4.2E-05
116.1362325	0.033153311	-0.004835	3.81E-18	-2.0708E-18	0.000267	-0.00015
122.706881	0.034910495	-0.00579	3.324E-18	-1.6099E-18	0.000253	-0.00012



129.8260313	0.036710537	-0.006662	5.059E-18	-1.1278E-18	0.000325	-7.2E-05
135.8356423	0.038662625	-0.007097	4.415E-18	-1.9389E-19	0.000307	-1.3E-05
142.3441585	0.0406607	-0.007185	5.005E-18	1.00195E-20	0.000327	6.55E-07
148.4598755	0.042660696	-0.007181	4.901E-18	1.70315E-18	0.000315	0.000109
154.4663752	0.044549895	-0.006524	6.096E-18	1.08917E-19	0.000361	6.45E-06
160.0074058	0.046549575	-0.006488	4.711E-18	-2.1915E-19	0.000317	-1.5E-05
166.3080518	0.048547415	-0.006581	4.879E-18	8.6713E-19	0.00032	5.69E-05
172.4547023	0.050516552	-0.006231	4.862E-18	7.70765E-19	0.00032	5.08E-05
178.6212859	0.052491888	-0.005918	4.941E-18	8.15663E-19	0.000323	5.33E-05
184.7353811	0.054465182	-0.005592	4.377E-18	1.54541E-18	0.000297	0.000105
191.0858669	0.056351095	-0.004927	4.167E-17	1.55506E-18	0.000943	3.52E-05
193.2046688	0.058349704	-0.004852	4.267E-18	1.44909E-18	0.000294	9.98E-05
199.6498897	0.06024349	-0.004209	4.978E-18	1.31512E-18	0.000321	8.47E-05
205.67979	0.062177149	-0.003698	4.437E-18	-2.0059E-18	0.000294	-0.00013
211.8800413	0.063999602	-0.004522	5.333E-18	-7.4483E-19	0.000336	-4.7E-05
217.7760753	0.06598038	-0.004799	4.555E-18	-2.6293E-18	0.00029	-0.00017
223.7420496	0.067712553	-0.005798	4.546E-18	-8.7751E-20	0.000312	-6E-06
230.1584604	0.06971218	-0.005837	4.84E-18	-7.9009E-19	0.000319	-5.2E-05
236.3371187	0.071686051	-0.006159	4.659E-18	8.12069E-19	0.000313	5.46E-05
242.6290978	0.073656339	-0.005816	4.919E-18	-1.0711E-18	0.00032	-7E-05
248.7269045	0.075610559	-0.006241	5.124E-18	-3.3639E-19	0.000331	-2.2E-05
254.7651595	0.077606262	-0.006372	4.599E-18	6.9838E-20	0.000313	4.76E-06
261.1446117	0.079606032	-0.006342	5.134E-18	-8.5975E-19	0.000329	-5.5E-05
267.1413025	0.08157857	-0.006672	5.658E-18	-5.038E-19	0.000347	-3.1E-05
272.8822051	0.083570688	-0.00685	5.806E-18	-2.6498E-18	0.000336	-0.00015
278.2980685	0.085390179	-0.00768	4.858E-18	-2.2769E-18	0.000307	-0.00014
284.2053759	0.087201101	-0.008529	4.932E-18	-2.0013E-18	0.000312	-0.00013
290.1360825	0.089054338	-0.009281	5.461E-18	-1.7936E-18	0.000333	-0.00011
295.8432499	0.090954466	-0.009905	4.815E-18	-2.6265E-18	0.000301	-0.00016
301.6854458	0.09271026	-0.010863	5.301E-18	-1.6193E-18	0.000329	-0.0001
307.4969562	0.094623016	-0.011447	5.116E-18	-2.4549E-18	0.000314	-0.00015
313.2409146	0.096426151	-0.012312	5.214E-18	-2.3456E-18	0.000319	-0.00014
318.9629743	0.098250111	-0.013133	5.171E-18	-1.6898E-18	0.000324	-0.00011

324.8293095	0.100151175	-0.013754	4.552E-18	-1.1264E-18	0.000307	-7.6E-05
331.1476174	0.102092619	-0.014234	5.646E-18	-2.017E-18	0.000337	-0.00012
336.7356539	0.103976032	-0.014907	4.079E-18	1.28745E-18	0.000288	9.1E-05
343.3510859	0.1058833	-0.014305	4.858E-18	-8.5563E-19	0.00032	-5.6E-05
349.5114405	0.107852985	-0.014652	4.508E-18	1.30653E-18	0.000304	8.82E-05
355.8268955	0.10977394	-0.014095	4.255E-18	-7.1167E-19	0.000299	-5E-05
362.4139906	0.111746545	-0.014425	5.28E-18	4.35746E-20	0.000336	2.77E-06
368.368198	0.113746477	-0.014409	5.557E-18	-9.3964E-19	0.000342	-5.8E-05
374.1316943	0.115718483	-0.014742	5.021E-18	5.73408E-18	0.000266	0.000304
379.0877933	0.117036013	-0.013237	6.859E-18	1.90817E-18	0.000376	0.000105
384.2157311	0.118962835	-0.012701	5.559E-18	-6.363E-19	0.000344	-3.9E-05
390.0001073	0.12094986	-0.012929	6.343E-18	1.22269E-20	0.000368	7.1E-07
395.4327876	0.122949856	-0.012925	6.285E-18	1.79089E-19	0.000366	1.04E-05
400.8892684	0.124949045	-0.012868	5.28E-18	-9.4294E-19	0.000333	-6E-05
406.7971571	0.126917896	-0.01322	5.534E-18	1.38469E-18	0.000339	8.47E-05
412.5255288	0.128858093	-0.012734	3.37E-18	1.13389E-18	0.000261	8.79E-05
419.7816108	0.130753671	-0.012096	4.434E-18	2.00421E-19	0.000308	1.39E-05
426.2760489	0.132751631	-0.012006	4.119E-18	1.31563E-18	0.00029	9.25E-05
432.8559012	0.13465681	-0.011398	3.327E-18	2.67721E-18	0.000235	0.000189
439.47707	0.13621494	-0.010144	5.36E-18	2.10608E-18	0.000326	0.000128
445.17883	0.138076377	-0.009412	4.264E-18	3.90397E-19	0.000301	2.76E-05
451.7912299	0.140068046	-0.00923	4.148E-18	1.98249E-18	0.000283	0.000135
458.1723113	0.141872562	-0.008367	4.861E-18	2.61666E-18	0.000302	0.000163
463.9954358	0.143633662	-0.00742	5.628E-18	1.99823E-18	0.000337	0.00012
469.5942367	0.14551839	-0.00675	6.483E-18	1.48266E-18	0.000367	8.4E-05
474.9000304	0.147468047	-0.006304	6.037E-18	2.3552E-18	0.000347	0.000135
480.2747364	0.149331296	-0.005578	7.27E-18	2.61736E-18	0.000382	0.000138
485.1969343	0.151213061	-0.0049	5.156E-18	2.88378E-18	0.00031	0.000173
490.8262358	0.152958587	-0.003924	5.268E-18	7.0327E-19	0.000334	4.46E-05
496.7612669	0.154941	-0.003659	5.426E-18	1.39339E-19	0.00034	8.74E-06
502.6340293	0.156940341	-0.003608	5.146E-18	1.50425E-18	0.000325	9.5E-05
508.5432191	0.158860004	-0.003047	6.81E-18	1.96316E-18	0.000374	0.000108
513.6826889	0.160781748	-0.002493	5.741E-18	1.49132E-18	0.000345	8.95E-05

519.300783	0.162717497	-0.00199	6.341E-18	1.15527E-18	0.000365	6.65E-05
524.6901247	0.164685108	-0.001631	6.038E-18	-6.7979E-19	0.000358	-4E-05
530.240785	0.166672552	-0.001855	5.947E-18	-4.0121E-19	0.000356	-2.4E-05
535.8448705	0.168668017	-0.00199	7.153E-18	-2.5481E-18	0.000379	-0.00014
540.8102415	0.170552038	-0.002661	5.797E-18	-2.8249E-19	0.000352	-1.7E-05
546.489455	0.172549667	-0.002758	7.385E-18	-9.4954E-18	0.000311	-0.0004
550.4344143	0.173777538	-0.004337	6.844E-18	-1.7322E-18	0.000377	-9.5E-05
555.5839603	0.175716397	-0.004828	7.042E-18	-2.625E-18	0.000375	-0.00014
560.5748777	0.177590441	-0.005526	5.172E-18	-3.5338E-18	0.000302	-0.00021
566.0418269	0.179241756	-0.006655	5.687E-18	5.08341E-19	0.000348	3.11E-05
571.7680521	0.181233812	-0.006477	4.226E-18	-4.3113E-18	0.000251	-0.00026
577.3367893	0.182633784	-0.007905	6.07E-18	-3.9905E-19	0.00036	-2.4E-05
582.8844948	0.184629475	-0.008036	5.481E-18	-1.0285E-18	0.000339	-6.4E-05
588.6785482	0.186595165	-0.008405	4.224E-18	-2.2251E-18	0.000283	-0.00015
594.9406519	0.188364635	-0.009337	5.284E-18	1.56569E-18	0.000329	9.75E-05
600.7690675	0.19028222	-0.008769	5.439E-18	-1.4205E-18	0.000335	-8.8E-05
606.5397621	0.192217321	-0.009274	6.683E-18	-2.8608E-18	0.000362	-0.00016
611.6145832	0.194055923	-0.010061	4.222E-18	-2.3803E-19	0.0003	-1.7E-05
618.2685036	0.196052751	-0.010174	6.129E-18	-1.3069E-18	0.000358	-7.6E-05
623.7342255	0.198008772	-0.010591	5.662E-18	-3.0714E-18	0.000326	-0.00018
629.1254143	0.199766739	-0.011545	6.887E-18	-3.3953E-18	0.000363	-0.00018
634.063002	0.201560606	-0.012429	8.406E-18	-4.1938E-18	0.000401	-0.0002
638.5271218	0.203350241	-0.013322	7.266E-18	-3.3507E-18	0.000375	-0.00017
643.3642588	0.205166418	-0.01416	7.159E-18	-6.4806E-18	0.000337	-0.0003
647.7671971	0.206649175	-0.015502	6.286E-18	-2.9235E-18	0.000349	-0.00016
652.9638544	0.208462629	-0.016345	8.283E-18	-1.2377E-18	0.000418	-6.3E-05
657.6917287	0.21044067	-0.016641	5.7E-18	-3.8923E-18	0.000317	-0.00022
662.8996873	0.212092325	-0.017769	6.107E-18	-3.9471E-18	0.000331	-0.00021
667.9737421	0.213772007	-0.018854	6.532E-18	-4.597E-18	0.000338	-0.00024
672.8149523	0.215407587	-0.020005	7.789E-18	-6.4742E-18	0.000358	-0.0003
677.1141444	0.216945674	-0.021284	6.667E-18	-5.6042E-18	0.00033	-0.00028
681.7504651	0.218476589	-0.022571	7.693E-18	-3.9676E-18	0.000382	-0.0002
686.4011416	0.220254089	-0.023487	7.711E-18	-6.0704E-18	0.00036	-0.00028

690.7688303	0.221825528	-0.024725	7.138E-18	-4.3599E-18	0.000361	-0.00022
695.4997287	0.223532351	-0.025767	6.928E-18	-3.9118E-18	0.000359	-0.0002
700.350632	0.225273877	-0.02675	6.347E-18	-2.4414E-18	0.000356	-0.00014
705.5974793	0.227140545	-0.027468	6.657E-18	-3.3237E-18	0.000357	-0.00018
710.6134117	0.228929922	-0.028362	7.622E-18	-2.144E-18	0.000396	-0.00011
715.4758925	0.230855205	-0.028903	7.436E-18	2.57061E-18	0.000388	0.000134
720.3538066	0.232745445	-0.02825	8.05E-18	-1.7383E-18	0.00041	-8.9E-05
725.1215341	0.234700388	-0.028672	8.956E-18	-4.9688E-18	0.000409	-0.00023
729.3967663	0.236449282	-0.029642	6.93E-18	-1.0266E-18	0.000383	-5.7E-05
734.5660299	0.238427691	-0.029935	5.683E-18	1.09017E-18	0.000345	6.62E-05
740.2538697	0.240391879	-0.029559	7.689E-18	-7.2985E-19	0.000404	-3.8E-05
745.1772167	0.242382929	-0.029748	7.818E-18	-9.7137E-19	0.000407	-5.1E-05
750.0518052	0.24436767	-0.029994	6.752E-18	-5.8754E-19	0.000379	-3.3E-05
755.3074612	0.24636014	-0.030168	6.776E-18	-2.4902E-18	0.000369	-0.00014
760.3998894	0.24823738	-0.030857	4.181E-18	2.30785E-18	0.00028	0.000154
766.6606473	0.249988388	-0.029891	6.734E-18	3.3968E-19	0.000379	1.91E-05
771.9300947	0.251985848	-0.02979	4.546E-18	-7.4934E-19	0.00031	-5.1E-05
778.3043202	0.253959221	-0.030116	6.733E-18	-2.9799E-19	0.000379	-1.7E-05
783.5746928	0.255957265	-0.030204	6.297E-18	-2.3745E-18	0.000355	-0.00013
788.8489452	0.257828634	-0.03091	5.981E-18	-4.6897E-18	0.000317	-0.00025
793.8118799	0.259402539	-0.032144	8.334E-18	-4.9174E-19	0.000422	-2.5E-05
798.5471853	0.261399066	-0.032262	7.046E-18	3.24908E-18	0.00037	0.00017
803.4591661	0.263215274	-0.031424	8.209E-18	-2.1516E-19	0.000419	-1.1E-05
808.2339682	0.265214588	-0.031476	6.497E-18	9.73063E-19	0.000371	5.55E-05
813.5723756	0.267192524	-0.03118	9.384E-18	-5.5918E-19	0.000447	-2.7E-05
818.0349585	0.269188982	-0.031299	7.973E-18	-1.7055E-18	0.000408	-8.7E-05
822.8267159	0.271144735	-0.031717	6.198E-18	1.39971E-19	0.000364	8.22E-06
828.3220849	0.273144226	-0.031672	-7.086E-17	-5.4058E-18	-0.00123	-9.4E-05
829.9451493	0.271150021	-0.031824	6.049E-18	-6.6734E-19	0.000358	-4E-05
835.4914123	0.27313796	-0.032044	7.028E-18	-2.3312E-18	0.000378	-0.00013
840.519596	0.275036253	-0.032673	8.922E-18	-6.048E-19	0.000436	-3E-05
845.0950343	0.277031674	-0.032809	6.936E-18	-6.7557E-19	0.000384	-3.7E-05
850.2782241	0.279022253	-0.033003	8.14E-18	-1.082E-19	0.000417	-5.5E-06

855.0738098	0.281022076	-0.033029	7.518E-18	-2.7334E-19	0.000401	-1.5E-05
860.062156	0.283020756	-0.033102	9.419E-18	1.30355E-19	0.000449	6.21E-06
864.5202362	0.285020564	-0.033074	6.484E-18	3.72784E-18	0.000347	0.000199
869.5233455	0.286754412	-0.032077	6.703E-18	5.69669E-19	0.000378	3.21E-05
874.7987057	0.288747228	-0.031908	5.085E-18	2.45372E-18	0.000313	0.000151
880.5569273	0.290548486	-0.031039	6.128E-18	5.41549E-19	0.000361	3.19E-05
886.0733812	0.292540722	-0.030863	4.888E-18	9.98183E-19	0.00032	6.53E-05
892.1992966	0.294500276	-0.030463	9.89E-18	-1.6878E-18	0.000456	-7.8E-05
896.5189633	0.296471773	-0.030799	7.352E-18	1.65367E-18	0.000391	8.81E-05
901.5031469	0.298423026	-0.03036	6.973E-18	4.24636E-19	0.000386	2.35E-05
906.6798166	0.300419328	-0.030239	9.819E-18	-9.4347E-20	0.000458	-4.4E-06
911.0460912	0.302419236	-0.030258	6.632E-18	5.56041E-18	0.00033	0.000276
915.697081	0.303951806	-0.028973	6.437E-18	-5.8753E-18	0.000319	-0.00029
920.3317404	0.305429028	-0.030321	7.663E-18	-3.5397E-19	0.000404	-1.9E-05
925.2716996	0.307426898	-0.030413	5.517E-18	-1.643E-18	0.000336	-0.0001
930.9742954	0.309343714	-0.030984	6.111E-18	2.12602E-18	0.000351	0.000122
936.3532565	0.311232667	-0.030327	3.639E-18	-1.7228E-18	0.000265	-0.00013
943.172005	0.313040329	-0.031183	4.086E-18	-5.9414E-19	0.000294	-4.3E-05
949.905749	0.315019512	-0.031471	5.886E-18	3.24934E-18	0.000332	0.000183
955.1826517	0.316770407	-0.030504	7.652E-18	-7.84E-19	0.000403	-4.1E-05
960.1160447	0.318759991	-0.030708	7.073E-18	4.2455E-18	0.00036	0.000216
964.8798822	0.320474783	-0.029678	6.956E-18	-2.6942E-18	0.000372	-0.00014
969.8894861	0.322339784	-0.030401	8.845E-18	-1.9131E-19	0.000435	-9.4E-06
974.4896302	0.324339317	-0.030444	9.407E-18	2.75829E-18	0.000439	0.000129
978.8595261	0.326258523	-0.029881	5.488E-18	-7.7093E-20	0.000342	-4.8E-06
984.6999863	0.328258325	-0.029909	5.536E-18	1.73639E-18	0.000336	0.000105
990.3803076	0.330166659	-0.029311	7.783E-18	2.09769E-18	0.000401	0.000108
995.1995824	0.332097746	-0.02879	5.021E-18	-1.0182E-18	0.000324	-6.6E-05
1001.244414	0.33405785	-0.029188	7.483E-18	-9.4362E-19	0.000398	-5E-05
1006.226641	0.336042134	-0.029438	5.254E-18	-2.038E-18	0.000324	-0.00013
1011.990411	0.337906759	-0.030161	5.982E-18	2.69126E-18	0.000341	0.000154
1017.332855	0.339730652	-0.029341	6.832E-18	4.07676E-19	0.000382	2.28E-05
1022.563019	0.3417271	-0.029222	6.757E-18	4.21584E-19	0.00038	2.37E-05

1027.821517	0.343723219	-0.029097	8.412E-18	-1.6926E-19	0.000424	-8.5E-06
1032.538451	0.345722814	-0.029137	5.919E-18	-2.2203E-18	0.000344	-0.00013
1037.980458	0.347595387	-0.02984	5.026E-18	1.88555E-18	0.000317	0.000119
1043.885675	0.349467969	-0.029137	6.347E-18	-2.7353E-18	0.000353	-0.00015
1049.0902	0.351304674	-0.029929	7.351E-18	9.85527E-19	0.000395	5.29E-05
1054.114286	0.353286939	-0.029663	7.208E-18	2.55099E-18	0.000381	0.000135
1059.062483	0.35517234	-0.028996	5.22E-18	4.03098E-20	0.000334	2.58E-06
1065.051176	0.35717228	-0.02898	7.394E-18	1.73244E-19	0.000397	9.31E-06
1070.082251	0.359171732	-0.028934	4.696E-18	4.90118E-18	0.000263	0.000275
1075.333845	0.360555442	-0.027489	5.793E-18	4.40109E-18	0.000314	0.000239
1080.406435	0.362148019	-0.02628	6.791E-18	-3.877E-18	0.000355	-0.0002
1085.299192	0.363884925	-0.027271	6.763E-18	-2.2105E-18	0.000371	-0.00012
1090.428582	0.365785961	-0.027892	9.713E-18	2.6759E-18	0.000447	0.000123
1094.739283	0.367714124	-0.027361	6.319E-18	7.26223E-19	0.000366	4.21E-05
1100.164449	0.369701045	-0.027133	7.056E-18	-3.8143E-18	0.000364	-0.0002
1104.995464	0.371460456	-0.028084	8.438E-18	1.54117E-18	0.000421	7.69E-05
1109.667242	0.373427908	-0.027725	6.195E-18	-7.3392E-19	0.000363	-4.3E-05
1115.145429	0.375414018	-0.02796				

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