```
Get["QUADRUPOLE"];

(*
 One-dimensional z-filtered MQMAS of a spin I = 5/2,
 Three pulse sequence,
 3 Q echo and -3 Q antiecho amplitude optimization with the third pulse,
 Coherence pathway 0 Q → ±3 Q → 0 Q → -1 Q,
 Wolfram Mathematica 5.0,
 Author: R. HAJJAR
 *)

(*------------ Nucleus ------------*)
quadrupoleSpin = 2.5;
larmorFrequencyMhz = 208.61889974; (* Al-27 with 800 MHz NMR spectrometer *)

(*----- Quadrupole interaction ----*)
quadrupoleOrder = 2;
QCCMHz = 5;        η = -1;

(*--- Rotor Euler angles in PAS ---*)
αPR = 0;       βPR = 0;        γPR = 0;

(*----------- Parameters ----------*)
startOperator = Iz;
ωRFkHz = 90;      (* strong RF pulse strength in kHz unit *)
ωRF3kHz = 9.3;   (* weak RF pulse strength in kHz unit *)
spinRatekHz = 5;
powderFile = "rep100_simp";
numberOfGammaAngles = 10;
t1 = 4;     (* the first-pulse duration in microsecond unit *)
t2 = 4;    (* the second-pulse duration in microsecond unit *)
t3 = 9;    (* the third-pulse duration in microsecond unit *)
Δt = 0.25;    (* pulse duration increment in microsecond unit *)
np = t3 / Δt;   (* number increment of the third-pulse duration *)

(*--------- Pulse sequence ---------*)
elements1 = {{2, 5}, {5, 2}};  (* ±3 Q matrix elements *)
coherence2 = {0};              (* 0 Q coherences *)
detectelt = {{4, 3}}; (* central-transition matrix element of a spin 5/2 *)

fsimulation := (
  pulse[t1, ωRFkHz];     (* first pulse *)
  filterElt[elements1];        (* ±3 Q coherence pathway selection *)
  pulse[t2, ωRFkHz];     (* second pulse *)
  filterCoh[coherence2];       (* 0 Q coherence pathway selection *)
  acq0;

  For [p = 1, p ≤ np, p++, {
    pulse[Δt, ωRF3kHz]; (* third pulse *)
    acq[p];
   }];
 );

(*--- Execute, plot, and save simulation
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  in "zfilter_P3" file -----------*)
run;
tabgraph["zfilter_P3"];

(* ------------------------------------ *)
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Rang	t (μs)	intensity
0	0	0.
1	0.25	−0.0007129352993
2	0.5	−0.001433705113
3	0.75	−0.002165686894
4	1.	−0.002906224332
5	1.25	−0.003648460088
6	1.5	−0.004384546413
7	1.75	−0.00510775821
8	2.	−0.005812808853
9	2.25	−0.006495587637
10	2.5	−0.007153618317
11	2.75	−0.007786967697
12	3.	−0.008398134973
13	3.25	−0.008990160432
14	3.5	−0.009564116213
15	3.75	−0.01011811309
16	4.	−0.01064876055
17	4.25	−0.01115377594
18	4.5	−0.01163342335
19	4.75	−0.01208974372
20	5.	−0.01252475249
21	5.25	−0.01293959077
22	5.5	−0.01333524813
23	5.75	−0.01371355034
24	6.	−0.01407679773
25	6.25	−0.01442605853
26	6.5	−0.01475987204
27	6.75	−0.01507498589
28	7.	−0.01536874034
29	7.25	−0.01564097868
30	7.5	−0.0158937954
31	7.75	−0.01612949109
32	8.	−0.01634864614
33	8.25	−0.01654985374
34	8.5	−0.01673097
35	8.75	−0.01689065135
36	9.	−0.01702925149