In[1]:=

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TestRuns = 0;
hit1 = 0;
miss1 = 0;
len = 10;
m = 6;
par = Array[am1, len^4];
ampa = Array[baba, len^4];
store = Array[am6, len^4];
For[i = 1, i < len + 1, i++,
     For[i2 = 1, i2 < len + 1, i2++,
        For[i3 = 1, i3 < len + 1, i3++,
           For[i4 = 1, i4 < len + 1, i4++,
                dzero = RandomReal[{0, 1}];
                done = RandomReal[{0, 1}];
                tmax = RandomReal[{0, 5}];
                tl = RandomReal[{0, 5}];
                k = RandomReal[{0, 1}];
                kf = RandomReal[{1, 100}];
                kr = RandomReal[{0, 1}];
                alph = RandomReal[{0, 5}];
                kb = RandomReal[{.5, 1}];
                kb2 = RandomReal[{0, .5}];

    qrt = NDSolve[{mRNA'[t] == tmax*A[t]^m/(k + A[t]^m) - dzero*mRNA[t],
       R'[t] == tl*mRNA[t] - done*R[t] - kb*R[t]*R[t] + 2*kb2*R2[t],
       R2'[t] == kb/2*R[t]*R[t] - kb2*R2[t] - kf*A[t]*R2[t] + kr*Z[t] - done*R2[t],
       A'[t] == alph - kf*A[t]*R2[t] + kr*Z[t] - done*A[t], Z'[t] == kf/2*A[t]*R2[t] -
         kr*Z[t] - done*Z[t], mRNA[0] == 0, R[0] == 0, R2[0] == 0, A[0] == 0, Z[0] == 0},
      {mRNA, R, R2, A, Z}, {t, 0, 3000}, MaxStepSize → 0.1, MaxSteps → 500000];
    J = Table[First[R2[t] /. qrt], {t, 1000, 3000, 1}];
    A1 = Table[First[R2[t] /. qrt], {t, 1000, 2000, 1}];
    A2 = Table[First[R2[t] /. qrt], {t, 2000, 3000, 1}];
    g = Fourier[J, FourierParameters → {1, 1}];
    g2 = Abs[g];
    g2[[1]] = 0;
    b = Position[g2, Max[g2]];
    c = Last[b];
    If[Length[b] > 1,
     If[g2[[First[c]]] > 5,
      amp1 = Max[A1] - Min[A1];
      amp2 = Max[A2] - Min[A2];

      If[amp2/amp1 > .9,
       hit1++;
       amp = Max[J] - Min[J];
       ampa[[hit1]] = amp;
       Print["Hit"];
       Print[Plot[R2[t] /. qrt, {t, 1000, 3000}]];
       par[[hit1]] = {dzero, done, tmax, tl, k, kf, kr, alph, kb, kb2}, miss1++;
       Print["Miss"]
        Print[Plot[lb[t] /. qrt, {t, 1000, 3000}]]], miss1++;
      Print["Miss"];
      Print[Plot[R2[t] /. qrt, {t, 1000, 3000}]]], miss1++;
     Print["Miss"];
     Print[Plot[R2[t] /. qrt, {t, 1000, 3000}]]];
    TestRuns++;
    Print[TestRuns];
   ]]]]
```