Appendix G
TIME DECAY FUNCTION CALCULATION

```
Clear["Global`@"];
SetDirectory["c:\disperrelax\acf"];
a = Input["Input α of H-N model"];
Print["alpha  ", a];
alpha  0.819999999999999928`
g = Input["Input γ of H-N model"];
Print["gamma  ", g];
gamma  0.379999999999999982`
tau = Input["Input τ of H-N model"];
Print["tau  ", tau];
tau  0.00747999999999999864`
k = ((1-a) Pi/2);
theta[w_] := ArcTan[(w tau)^a Cos[k] / (1 + (w tau)^a Sin[k])];
r[w_] :=
 (1 + (w tau)^a Sin[k])^2 + ((w tau)^a Cos[k])^2;
amp[w_] := (2/Pi Sin[theta[w] g]) / (r[w])^(g/2);
fname =
 InputString["Input the name of the data file
   to store ACF calc. results"]
"peinh215kbend215.txt"
OpenWrite[fname];
Do[
 t = 10^lt;
 hp = N[Pi/t];
 Print["================================"];
 Print["half period ", hp];
 s = 0;
 l1 = 0; l2 = l1 + hp;
 obj[w_] := amp[w] (Cos[w t]/w);
 Print["  "];
 (Label[again];
 m = NIntegrate[obj[w], {w, l1, l2},
            MaxRecursion -> 40];
            s = s + m;
            l1 += hp ; l2 += hp;
   If[Abs[m] > 10^-6, Goto[again]]);
   Print["ACF at t= ",
  t," is ",s," up to w = ", l2];
 Write[fname, lt, "=",s],
                          {lt, -11, 5, 0.1}];
```