

Programs 1

Main routine of macro-program to define the function of Eq. [1] by IGOR Pro. The fitting result is presented in the Figure 2. Comments after // are not functional in the program.

```
// Fitting function of experimental data: Definition of  $s(z,t)$  in Eq.[2]
Function Hfunc(w,x): FitFunc
    wave w          // Variables for the fitting
    variable x      // Experimental data
    variable T1, T2 // Initial time of positive and negative oscillation

    T1 = w[2]
    T2 = w[2]+w[3]
    return Limitation(Travib(w[0],w[4],w[5],T1, x) -Travib(w[1],w[4],w[5],T2, x))
end

// Function of transient vibration: Definition of  $h(t)$  in Eq.[3]
Function Travib(Amp, Freq, Extinc, TDlay, x)
    variable Amp, Extinc, Freq, TDlay
    variable x

    if (x - TDlay*1e-6 <0)
        return 0
    else
        return Amp/(2*Pi * 1000*Freq)*exp(-1*(x-TDlay*1e-6)/Extinc*1e6)*
            sin((x-TDlay*1e-6)*2*Pi * 1000*Freq)
    endif
end

// Function to cut data which are out of range of the detection limitation of QPD
Function Limitation(y)
    variable y
    wave L_coef      // Constants to define detection limitation of QPD

    if (y>L_coef[0])
        return L_coef[0]
    elseif (y<L_coef[1])
        return L_coef[1]
    else
        return y
    end
end
```

```
endif  
end
```