Programs 2

Main routine to calculate the ratio of impulse loaded on a cantilever, corresponding to *F(z)* in Eq. [2], by Visual Basic 6.0. The calculation parameters are for experimental conditions in the literature (Hosokawa *et al*., 2011). The calculation is performed changing Z distance between laser focal point and cantilever (ZO) from -50 to 50 [μm] with interval of 1 [μm]. Comments after apostrophes are not functional in the program.

```
'Ratio of impulse loaded on cantilever (Integral of impulse loaded on cantilever)
'ZO: Z distance between laser focal point and cantilever

Function FF(ZO As Single) As Single
    Dim X, L, Z, W, HW, XX, ZZ, YY, XO As Single
    Dim Sita, Pi, PP As Single
    Dim FF(10000, 10000), FFA(10000), FFsum(10000), DFF(1000) As Single

    XO = 10 'X distance between laser focal point and cantilever
    L = 119   'Length of cantilever
    W = 30   'Width of cantilever
    Sita = 7  'Angle of cantilever
    Pi = 3.141592         'Circle ratio
    PP = 0.1 'Calculation step with square (PP * PP) corresponding to area of Δs.

    HW = Int(W / 2)

    For YY = 0 To HW Step PP
        FFsum(YY / PP) = 0

     'This is calculation when wedge angle of the cantilever top is 45 degree.
     For X = YY To L Step PP
        FF(X / PP, YY / PP) = 0
            XX = XO * Cos(Pi * Sita / 180) - (ZO + Z) * Sin(Pi * Sita / 180)
            ZZ = XO * Sin(Pi * Sita / 180) + (ZO + Z) * Cos(Pi * Sita / 180)
            FF(X / PP, YY / PP) = FF(X / PP, YY / PP) - (1 / 4 / Pi) * ZZ ^ 3
              * ((XX + X) ^ 2 + YY ^ 2 + ZZ ^ 2) ^ -1.5
              * ((XX + X) ^ 2 + ZZ ^ 2) ^ -0.5 * (YY ^ 2 + ZZ ^ 2) ^ -0.5 * PP * PP
        FFsum(YY / PP) = FFsum(YY / PP) + FF(X / PP, YY / PP)
     Next X
    Next YY

    FF = 0
```

```
    For YY = -1 * HW To HW Step PP
        FF = FF + FFsum(Abs(YY / PP))
    Next YY

End Function
```