Principles of Biomedical Ultrasound and Photoacoustics
hw01: Displacement and Strain

Due on Thursday, Nov 2, 2017

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1　Introduction

For **Focused Ultrasound Thermal Therapy**, an important technique is to estimate the temperature change before and after applying it. The estimation can be derived by the echo-time shift before and after heating. Moreover, the temperature change can be formula as:

$$\Delta T(z) = \frac{C_0}{2} \cdot K \cdot \frac{\partial \Delta t(z)}{\partial z} \tag{1}$$

where $\Delta T(z)$ is the temperature change, C_0 is the speed of sound, K is a constant, $\frac{\partial \Delta t(z)}{\partial z}$ is the **thermal strain**.

In this homework, we need to finish the following requirements:

1. Estimate echo time shift in μs as a function of depth

2. Estimate thermal strain in % as a function of depth

2　Source Code

In this zip archive, there are two matlab source code files:

1. **EE6265_HW1_106061531.m**

2. **Windows.m**

"EE6265_HW1_106061531.m" is the main flow of this homework. It will use the class **Windows** in "Windows.m" to create an object, which can manage each window and makes our code more elegant, and plot figures with our given parameters.