

Introductory Lecture on Nonlinear Acoustics

1. Introduction (history, examples...)

2. Fundamental equations of nonlinear acoustics in fluids

Towards Westervelt equation

3. Model equations of nonlinear acoustics

Burgers, KZK, ...

4. Approximation methods and several classical effects

Successive approximation, multiple scales, harmonic balance...

5. Some few classical problems and beyond

Fluids
~1h30

6. Fundamental equations of nonlinear acoustics in solids

7. Similarities with NLA in fluids, specificities of solids

8. Nonclassical nonlinearities in solids and origins

Behavior of solid contacts, cracks, ... Hysteretic nonlinearity...

9. Applications to NDT and various fundamental effects

Solids
~1h30