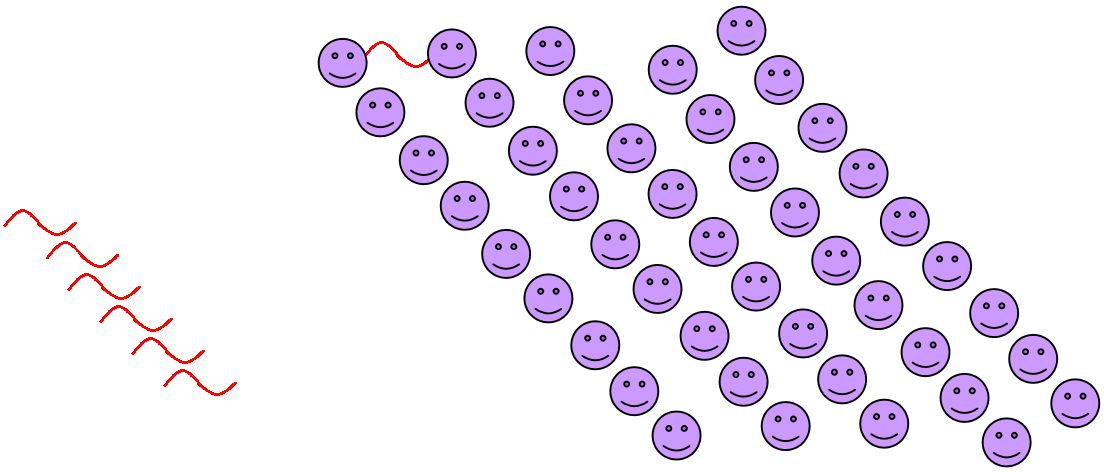
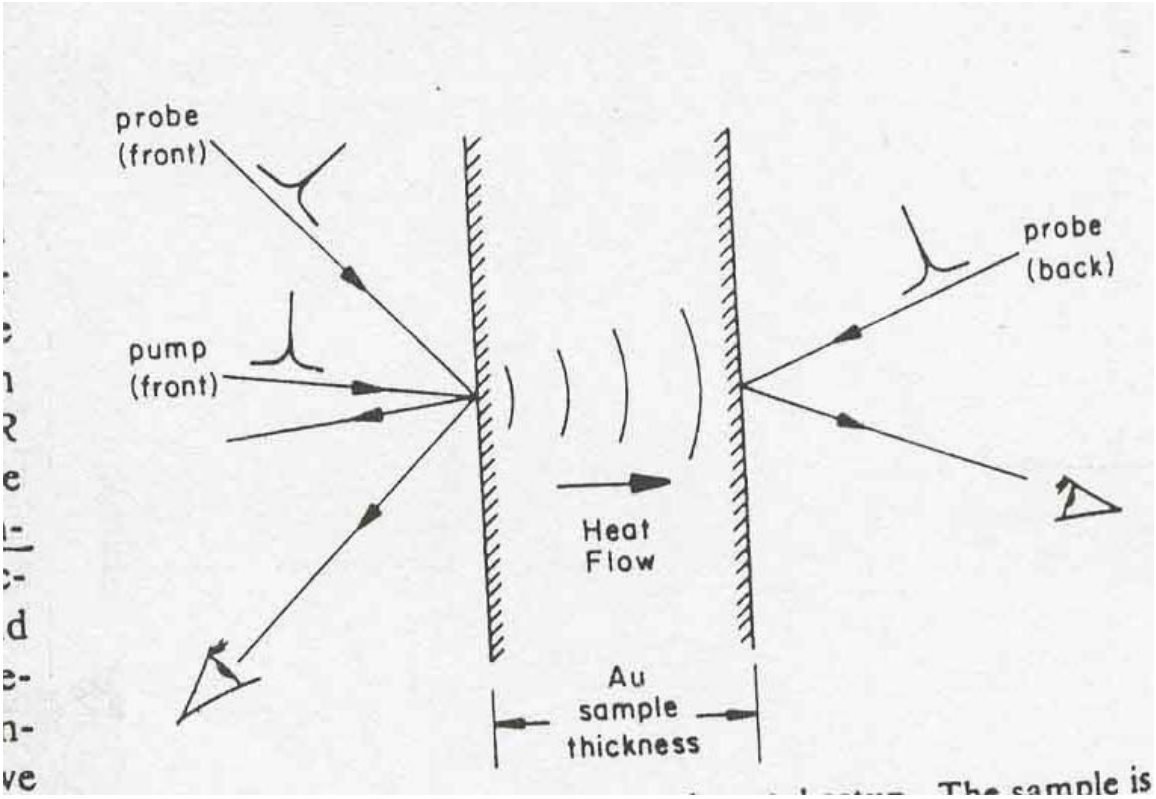
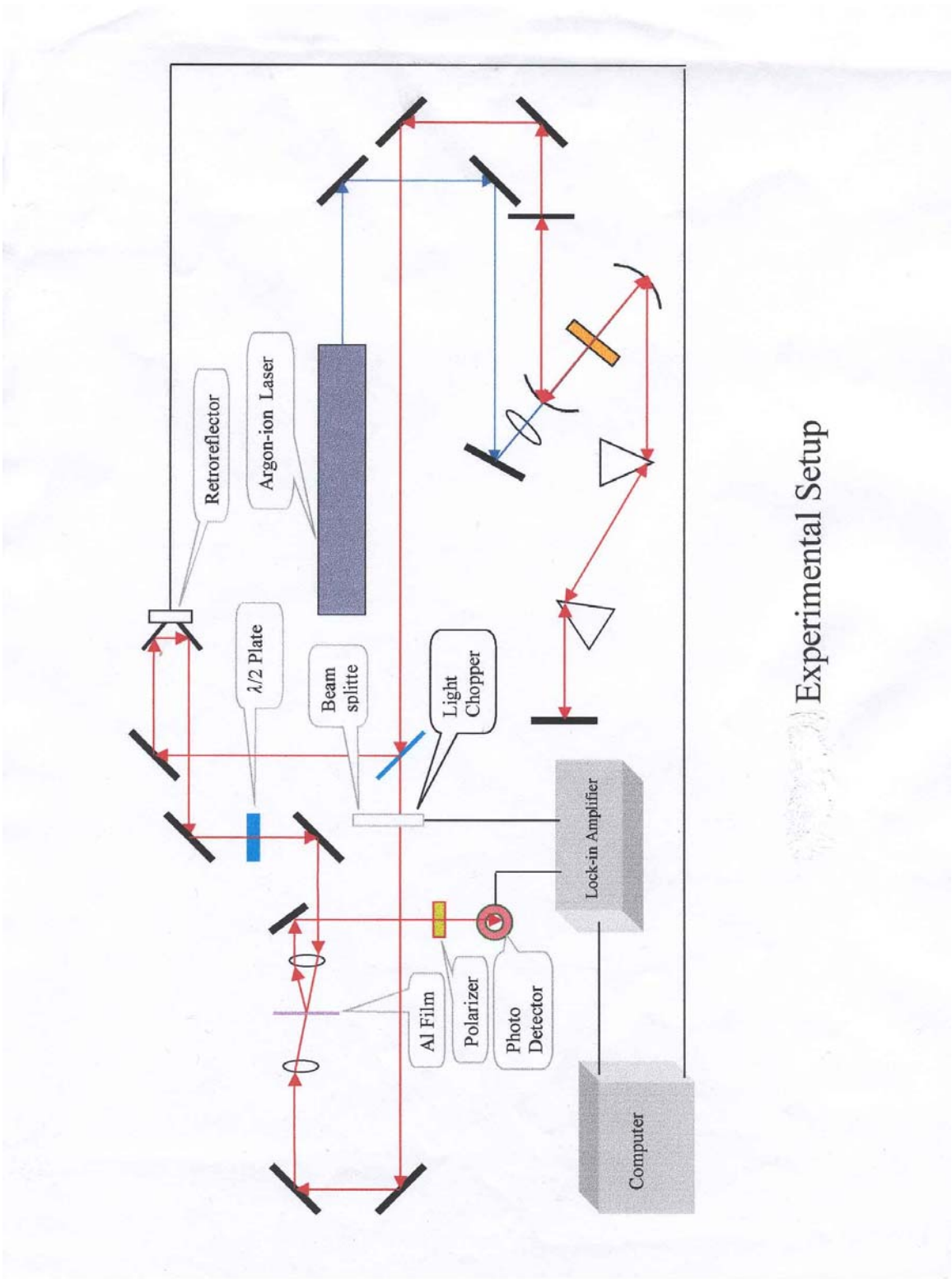
FEMTOSECOND METHODS IN ULTRATHIN METALLIC FILMS STUDY




probe
(front)
pump
(front)
probe
(back)
Heat
Flow
Au
sample
thickness



Experimental Setup

$$\omega_{min} = \frac{a\omega_{max}}{2}\frac{\pi}{L}$$

$$W = W_{bulk}\left(1 - e^{-L/\Lambda}\right)$$

$$v_g = \partial\omega/\partial q = \frac{1}{2}\omega_{max} \cdot a \cdot \cos\left(\frac{qa}{2}\right)$$

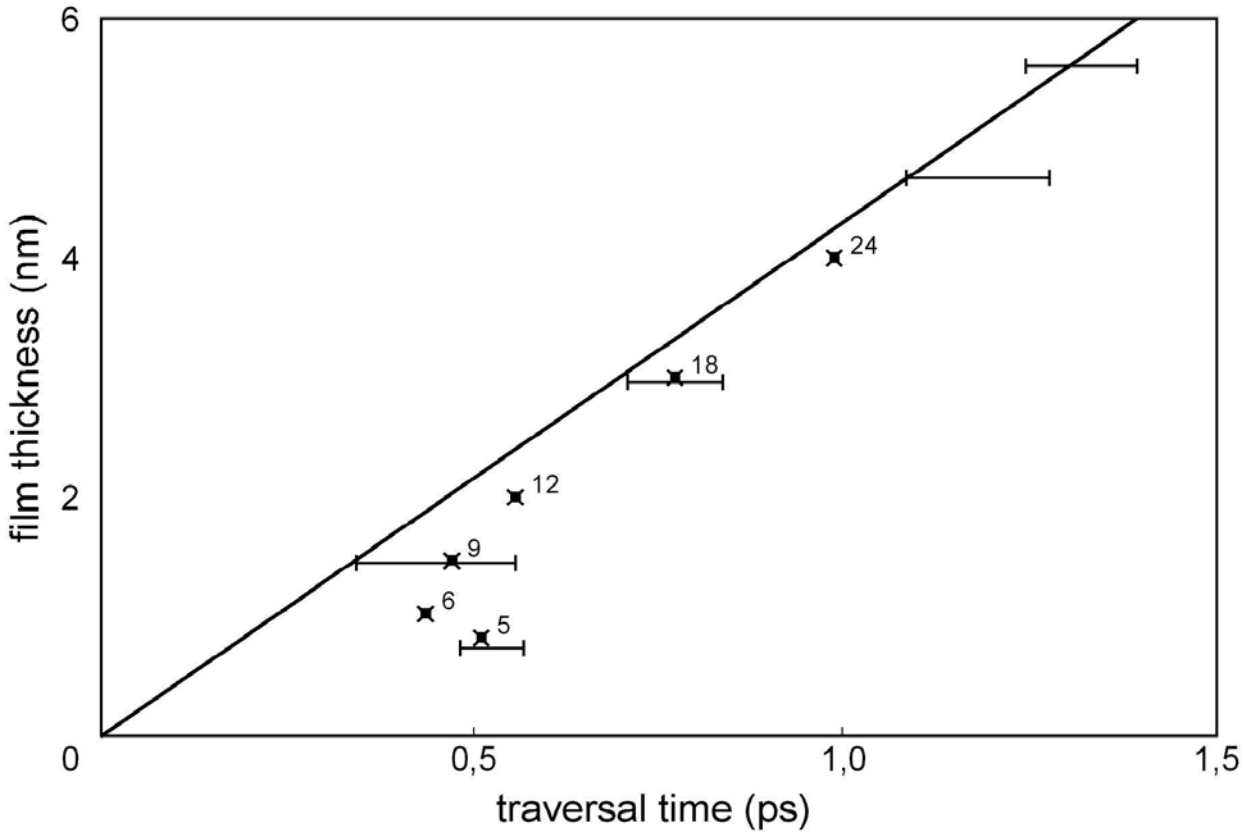
$$v_g = \frac{\omega_2 - \omega_1}{q_2 - q_1}$$

$$m\ddot{u}_\nu = -k(2u_\nu - u_{\nu+1} - u_{\nu-1})$$

$$\omega_n = \omega_{max} \left| \sin\left(\frac{2n-1}{2N+1} \cdot \frac{\pi}{2} \right) \right|,$$

$$\ddot{u}_\nu + \frac{k}{m}(2u_\nu - u_{\nu+1} - u_{\nu-1}) =$$

$$= \alpha\left[(u_{\nu+1} - u_\nu)^2 - (u_\nu - u_{\nu-1})^2\right] + f(t)$$



APPLICATIONS

- OPTOELECTRONICS
- THEORY OF SUPERCODUCTIVITY
- FREQUENCY CONVERSION

1.A.Melikyan, H.Minassian. Review: Trapped Phonons in Ultrathin Metallic Films: Interpretation of Recent Femtosecond Experiments. Quantum Electronics, **32,** n9, pp. 756-764(2002)

2.A.Melikyan, H.Minassian, Phonon confinement in Ultrathin Metallic Films: Interpretation of Recent Femtosecond Pump-Probe Experimental Data. In *Femtochemistry and Femtobiology*, World Scientific, pp.702-708(2002).

3.A.O.Melikyan, H.R.Minassian, Interaction of vibrational modes in ultrathin metallic films following femtosecond excitation. Solid State Communications,**119/8-9**, pp. 497-499 (2001).

4.A.O.Melikyan, H.R.Minassian, Phonon confinement in ultrathin nickel films, Chem.Phys.Lett., **331/2-4**, pp.115-118 (2000)

5.A.Melikyan, H.Minassian, A,Guerra III, W.Wu, On the theory of relaxation of electrons excited by femtosecond laser pulses in thin metallic films, Applied Physics B, Lasers and Optics, Springer, **68,** pp411-414,(1999).