

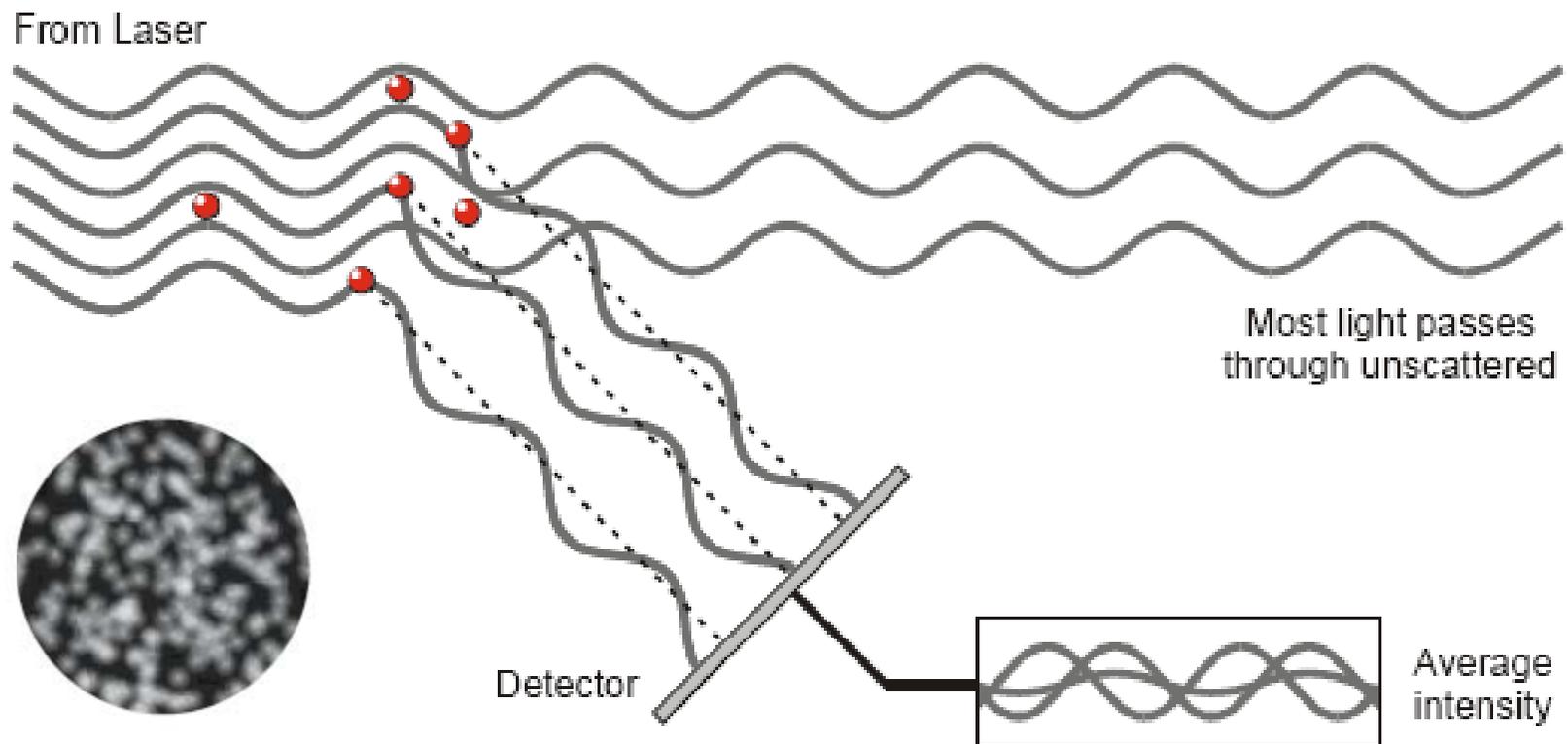
Динамическое и электрофоретическое светорассеяние

Д.М.Иткис
факультет наук о материалах МГУ

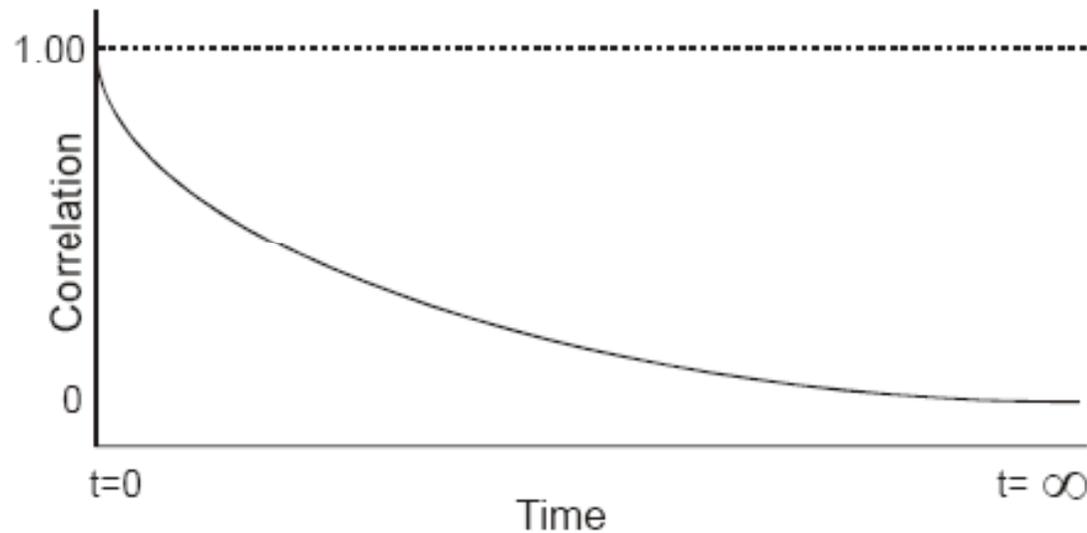
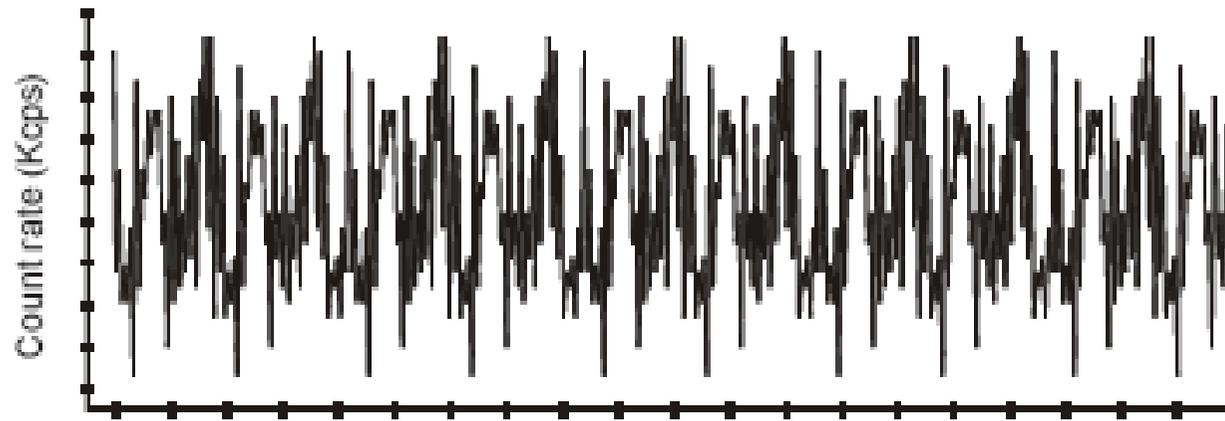
Malvern Instruments
ZETASIZER NANO ZS

РАСПРЕДЕЛЕНИЕ ПО РАЗМЕРАМ

Светорассеяние

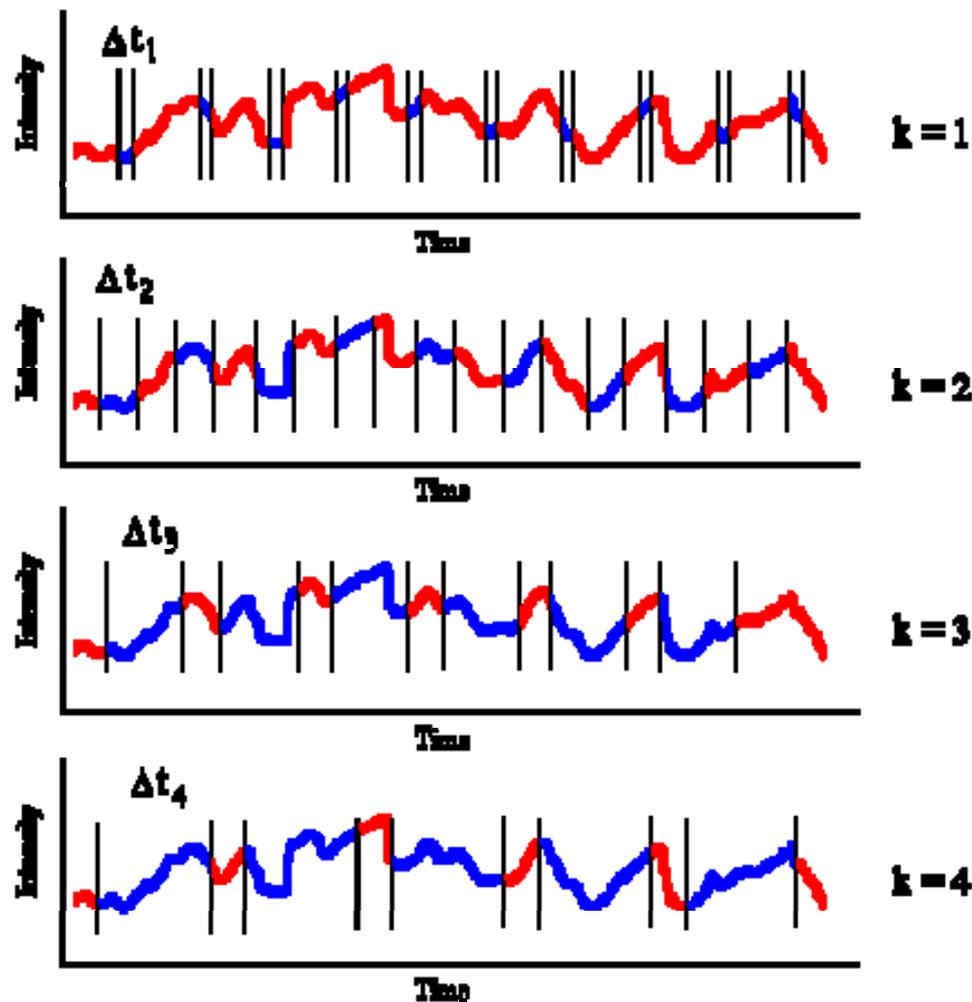


Корреляция интенсивности



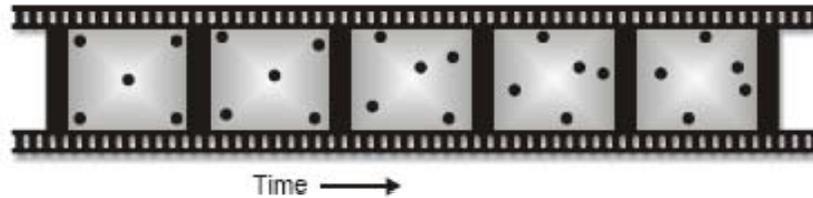
$$G(\tau) = \int_0^{\infty} I(t)I(t + \tau)dt$$

Корреляция интенсивности

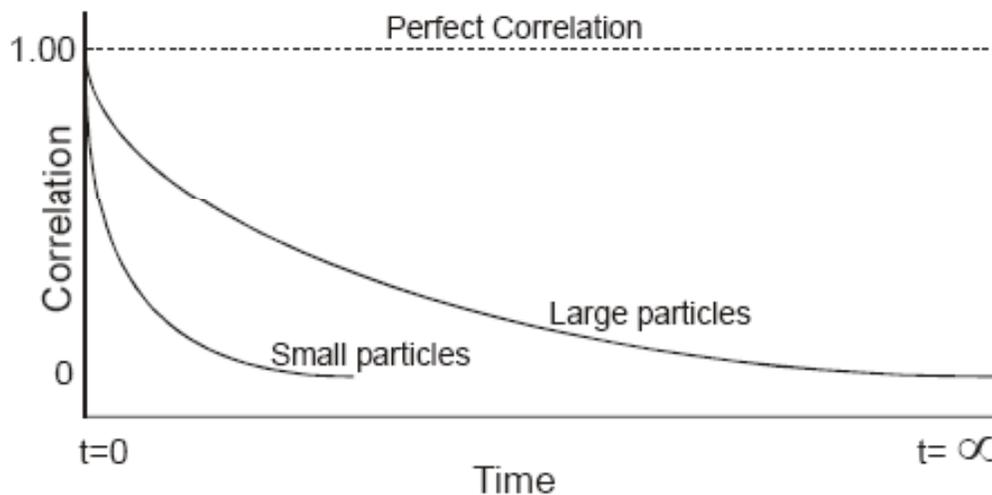
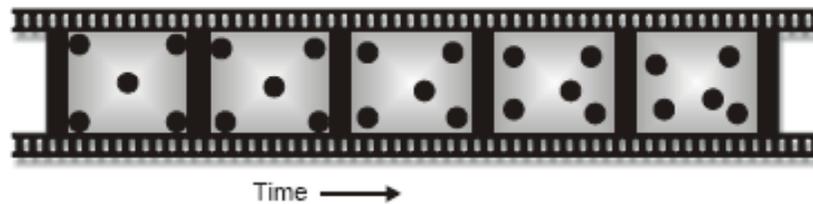


Определение коэффициентов диффузии

Small particles moving quickly



Large particles moving slowly

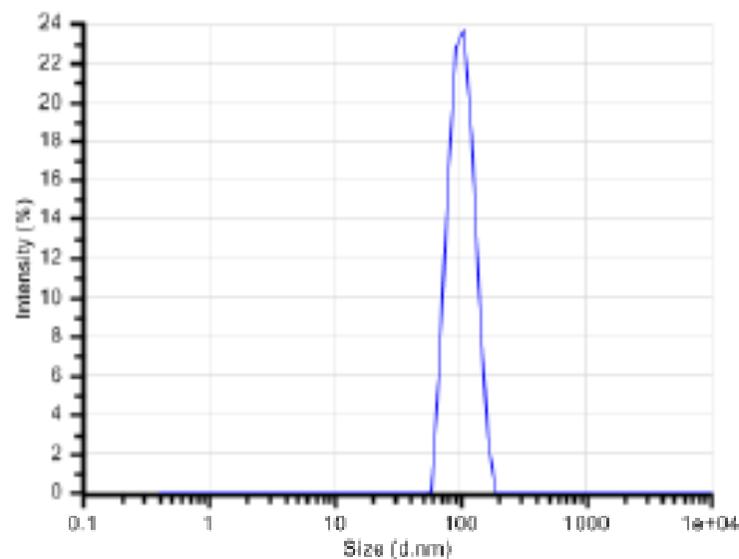
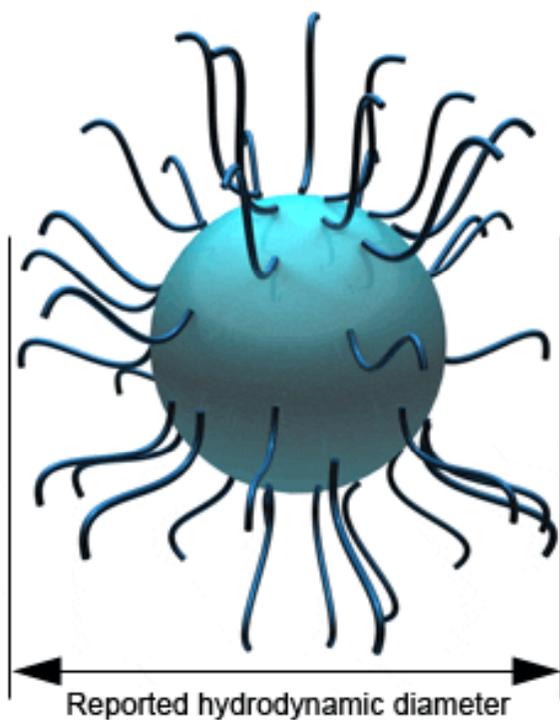


$$\int T(t) T(t + \tau) dt = B + A e^{-2q^2 D \tau}$$

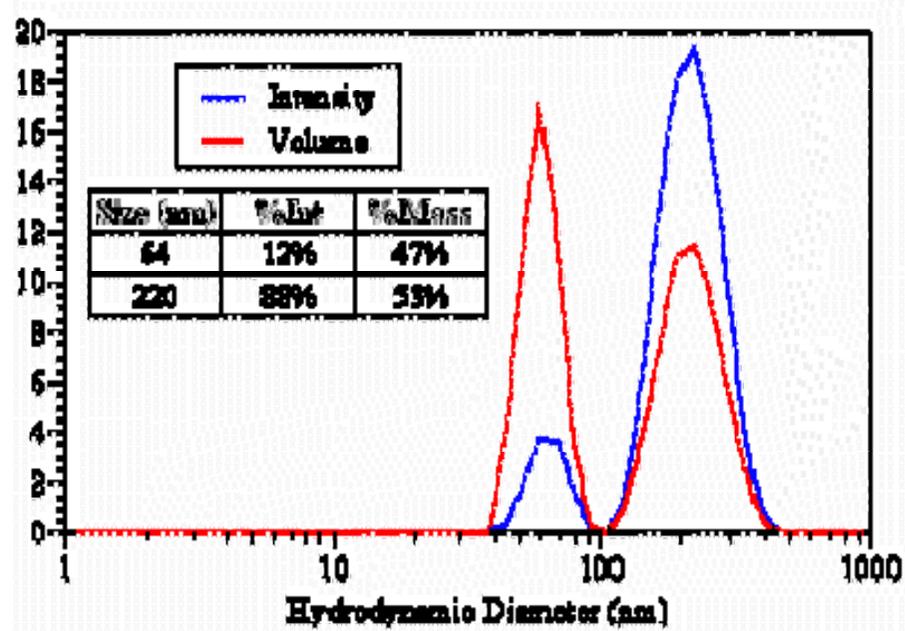
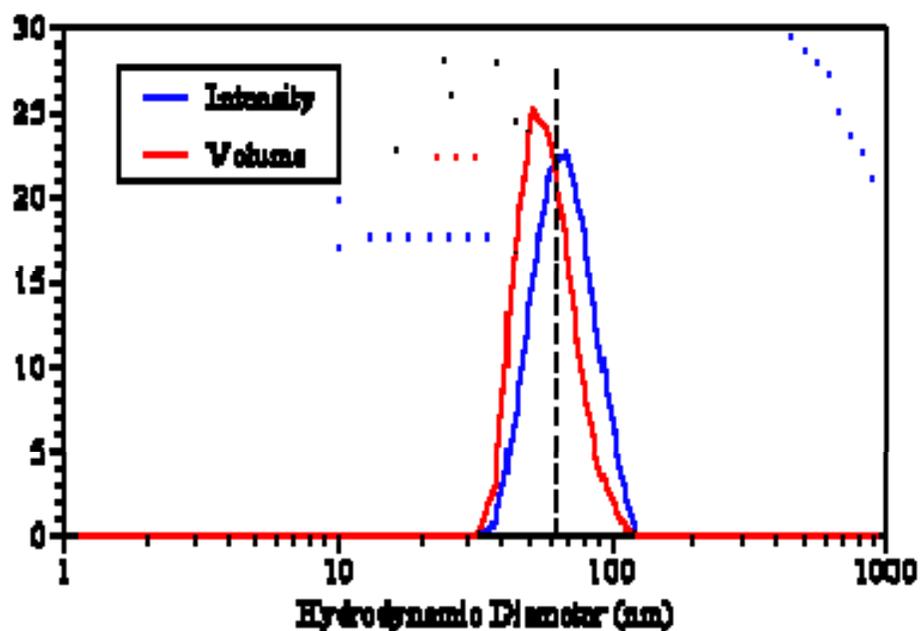
$$q = \frac{4\pi n}{\lambda_0} \sin\left(\frac{\theta}{2}\right)$$

Распределение по размерам

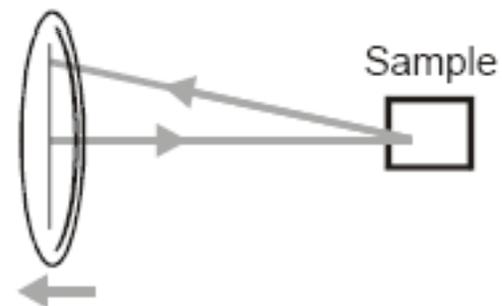
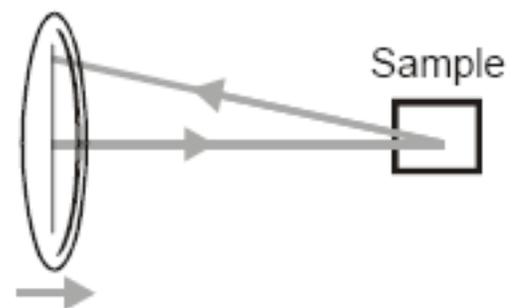
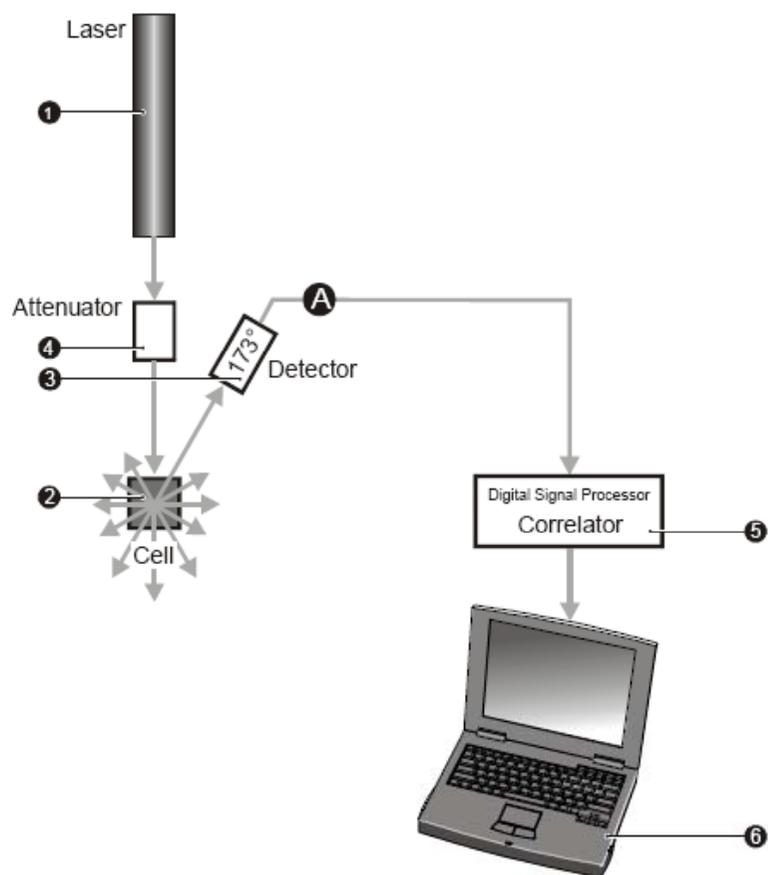
$$R_H = \frac{kT}{6\pi\eta D}$$



Взвешенные распределения

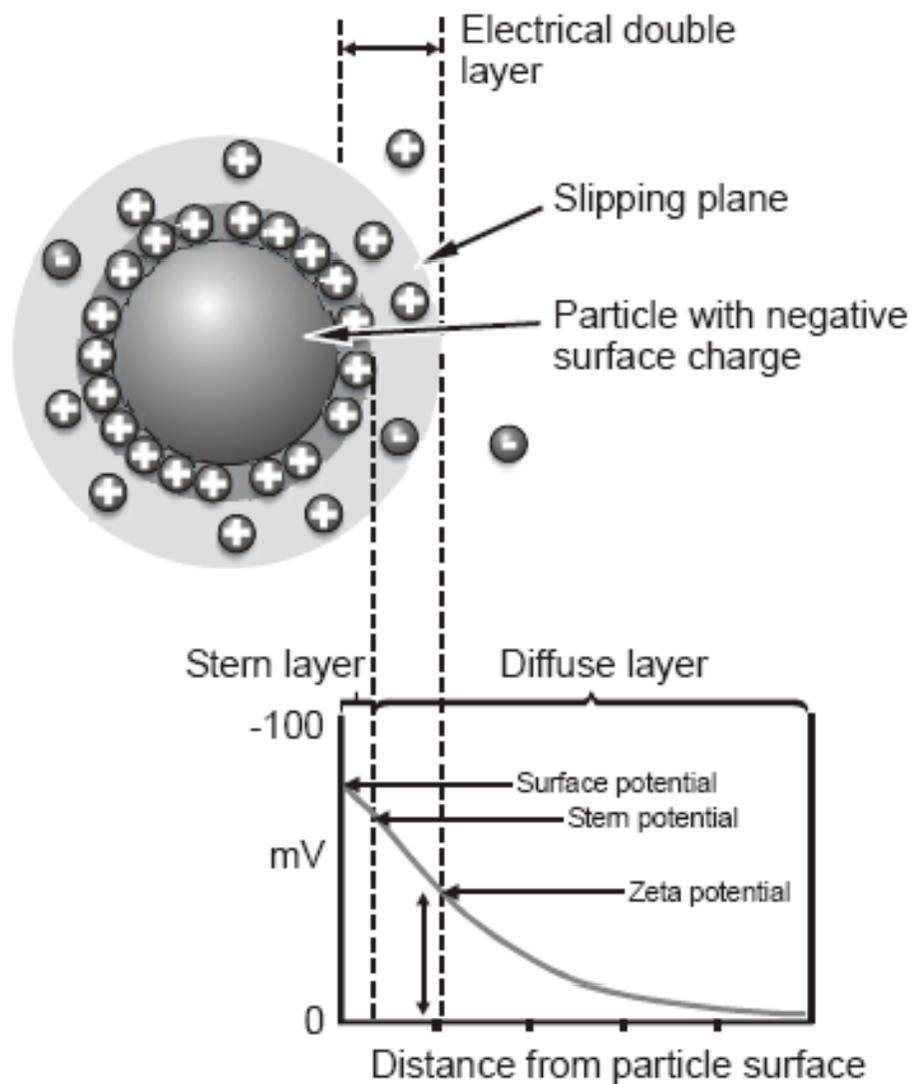


Оптическая схема

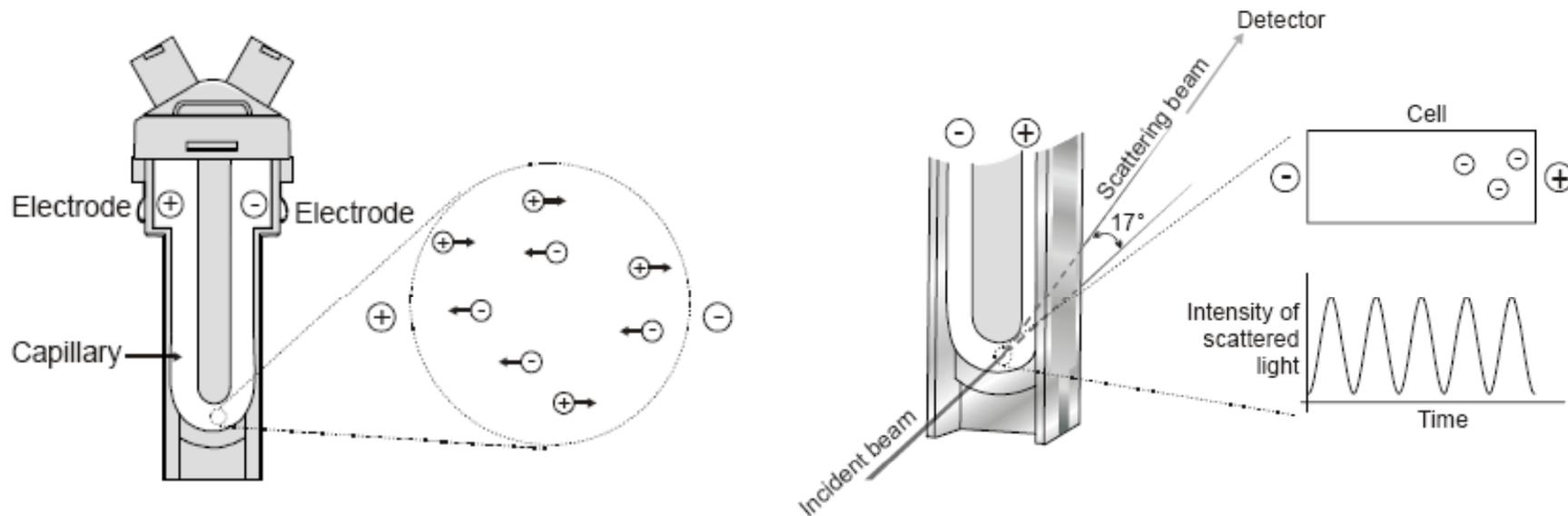


ЭЛЕКТРОКИНЕТИЧЕСКИЙ ПОТЕНЦИАЛ

ζ -потенциал

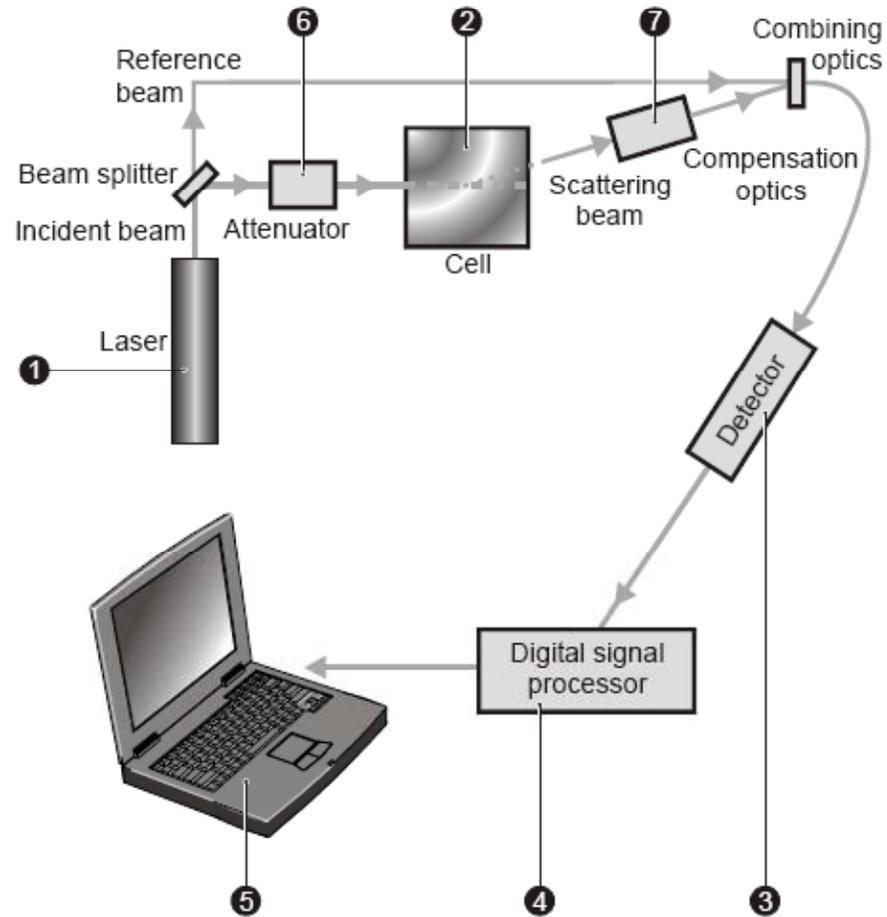


Измерение электрофоретической ПОДВИЖНОСТИ

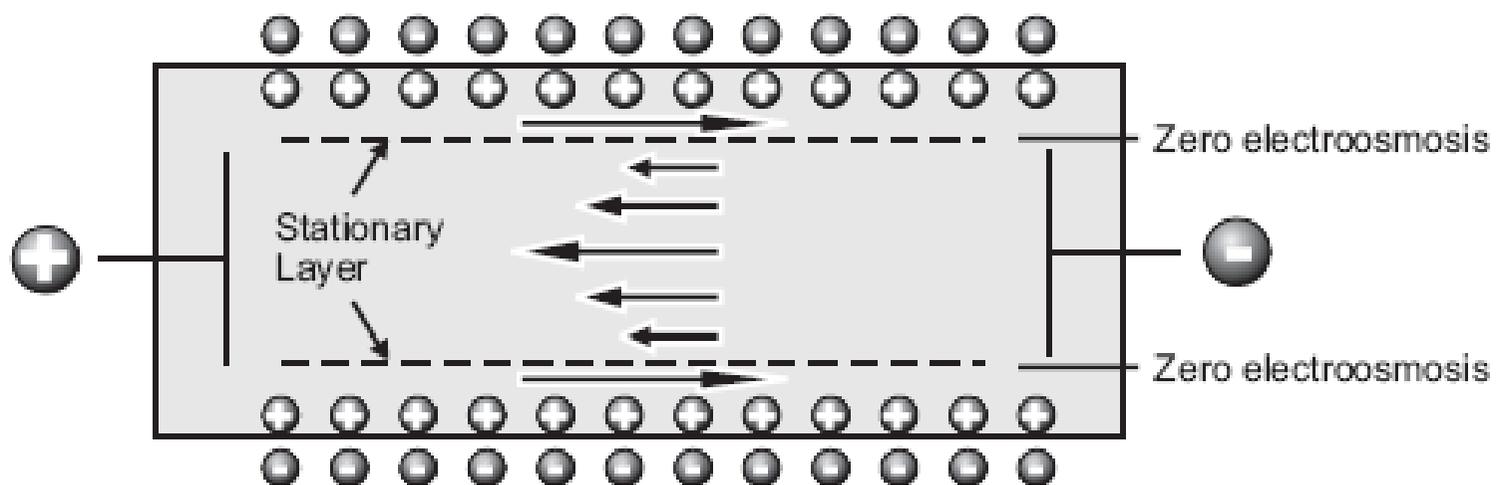


$$\Delta v = 2U_e \frac{\sin(\theta/2)}{\lambda}$$

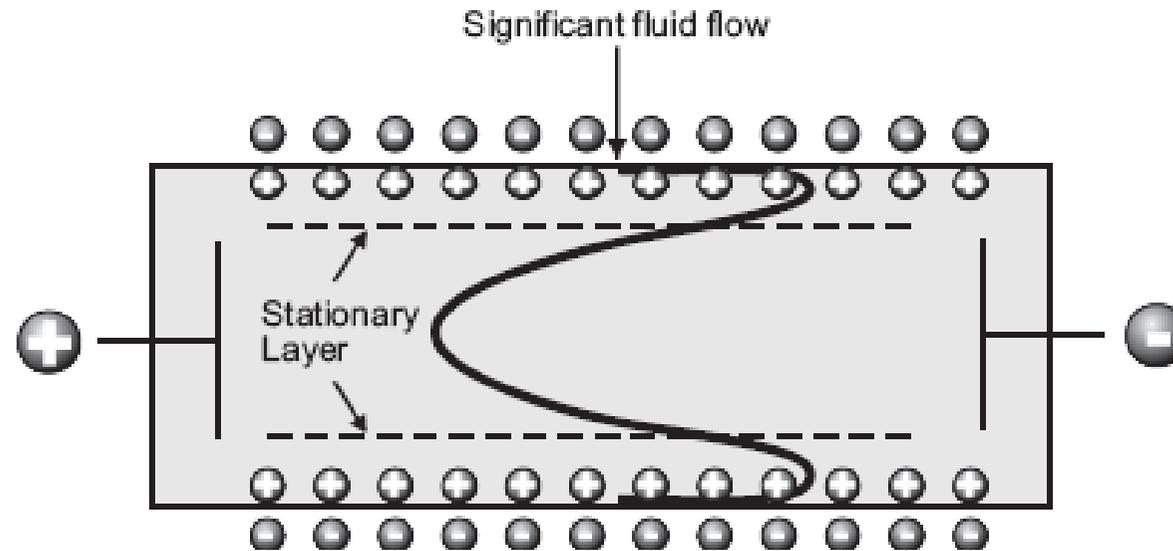
Оптическая схема



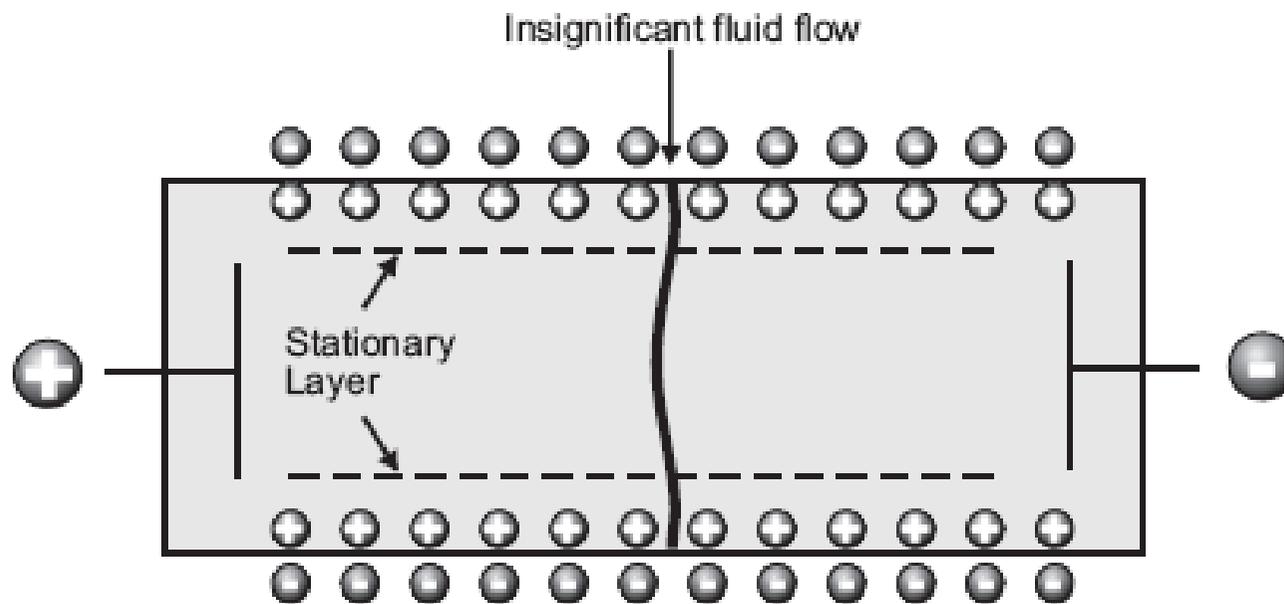
Электроосмос



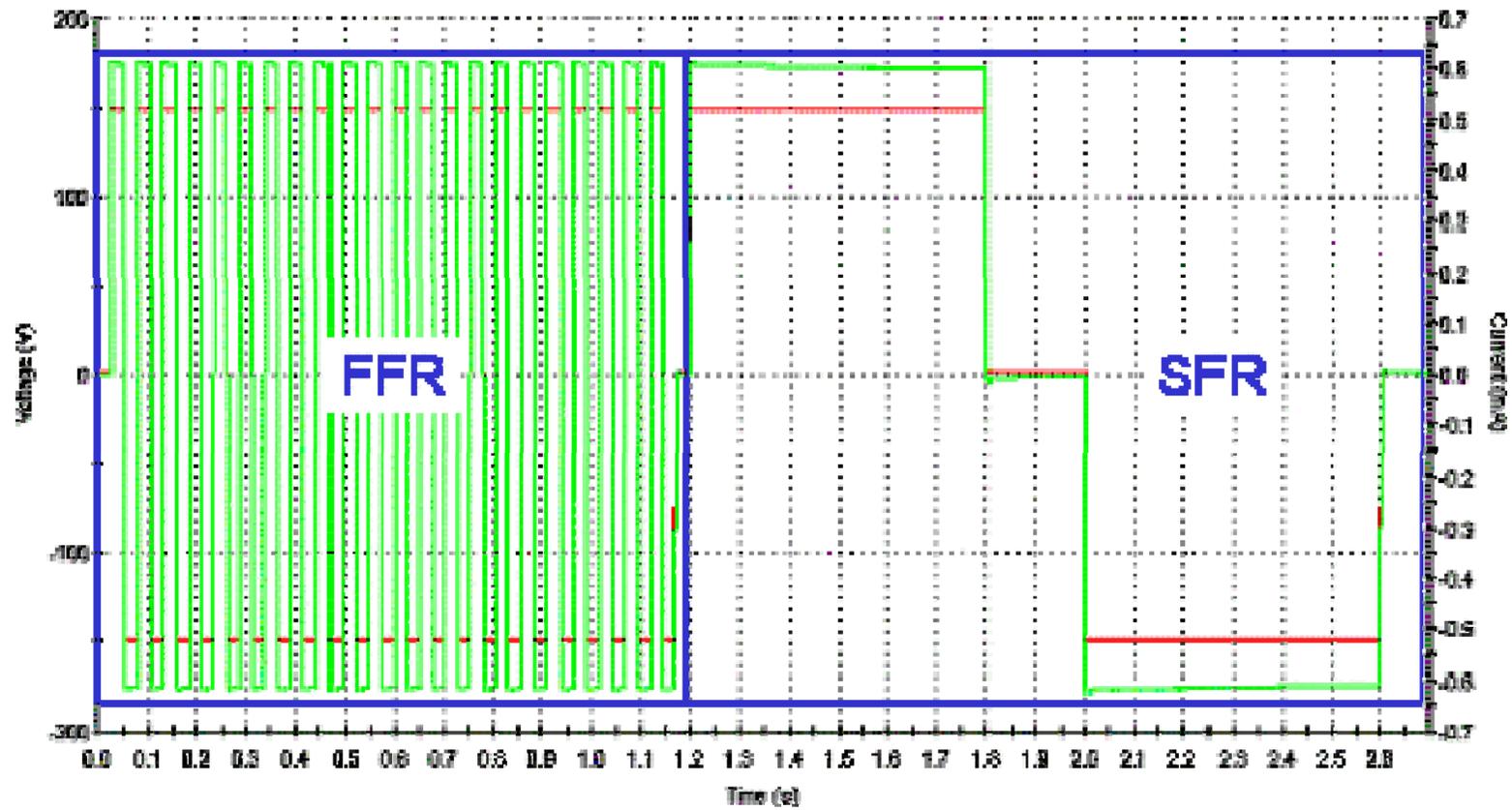
Slow Field Reversal (SFR)



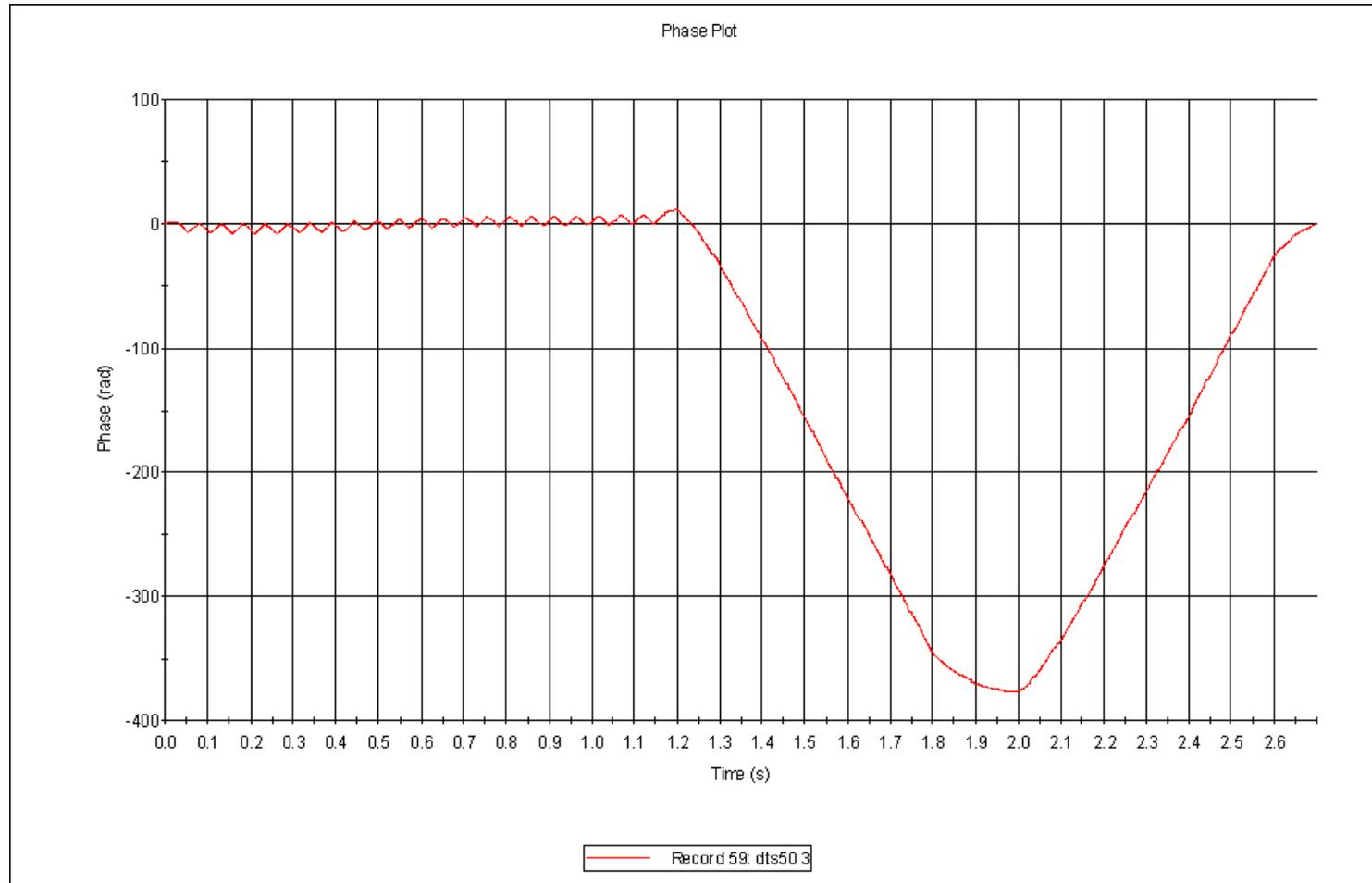
Fast Field Reversal (FFR)



M3-PALS



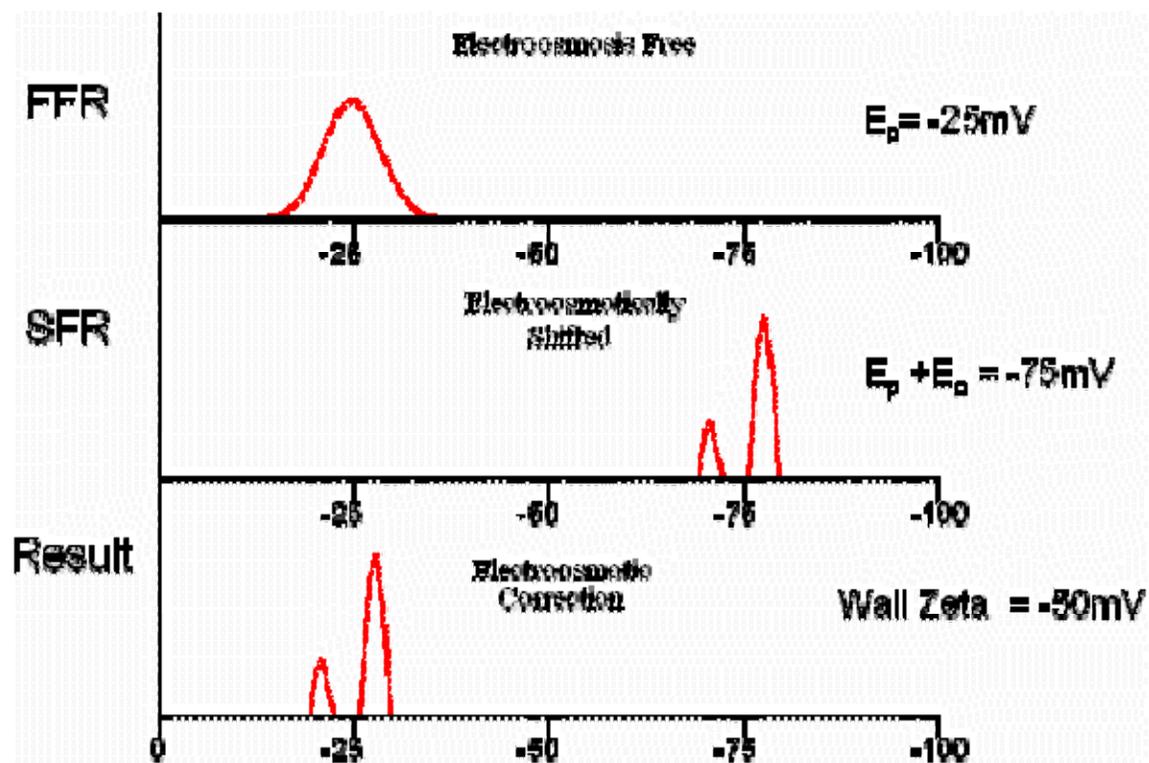
M3-PALS



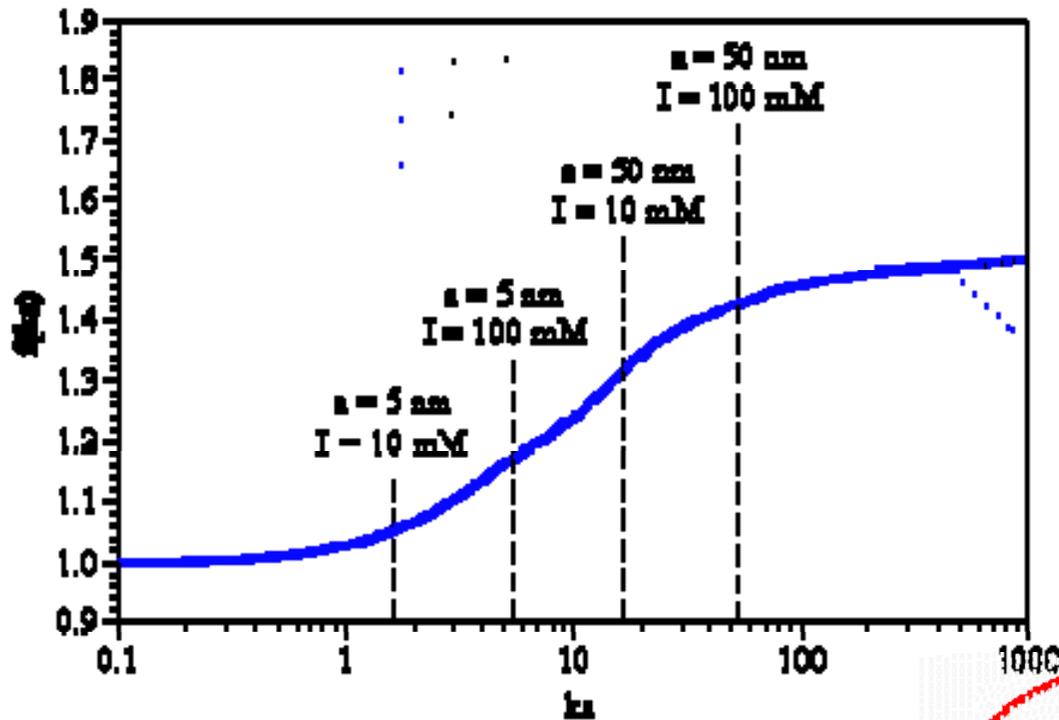
M3-PALS метод

- FFR – средняя подвижность
- SSR – распределение подвижностей
- Расчет скорости электроосмоса
- Перерасчет распределения подвижностей

M3-PALS метод



Вычисление ζ -потенциала



$$U_e = \frac{2\epsilon\zeta f(\kappa a)}{3\eta}$$

