

FAN:

GIDROMETRIYA

MAVZU

10

# Suvning oqish tezligini o'lchash usullari



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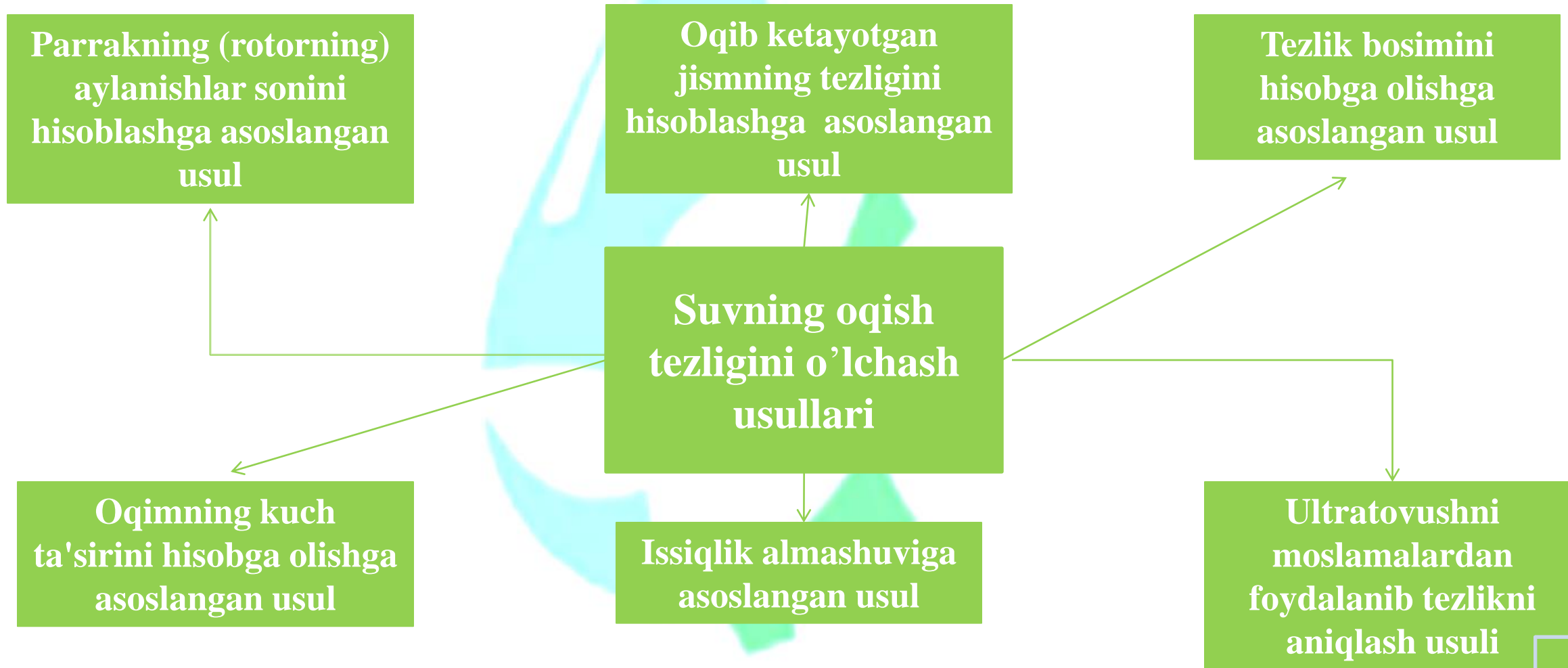


Gidrologiya va gidrogeologiya  
kafedrası dotsenti

# Reja:

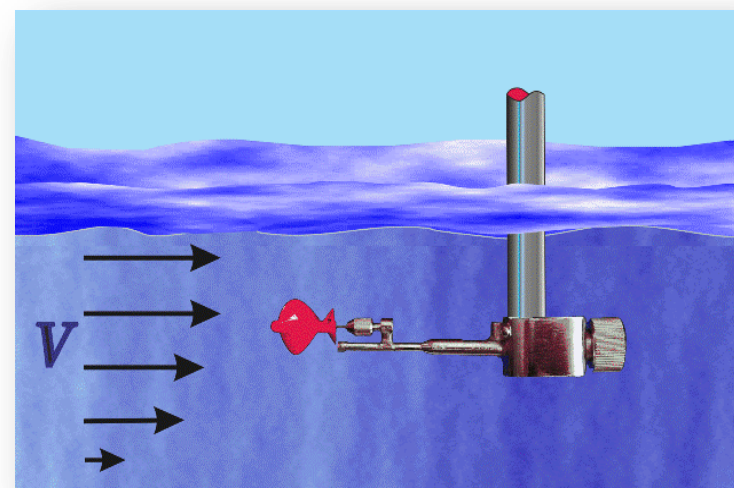
- ❑ Parrakning (rotorning) aylanishlar sonini hisoblashga asoslangan usul;
- ❑ Tezlik bosimini hisobga olishga asoslangan usul.
- ❑ Oqimning kuch ta'sirini hisobga olishga asoslangan usul . Iссиqlik almashuviga asoslangan usul .

# Suvning oqish tezligini o'lchash usullari klassifikatsiyasi



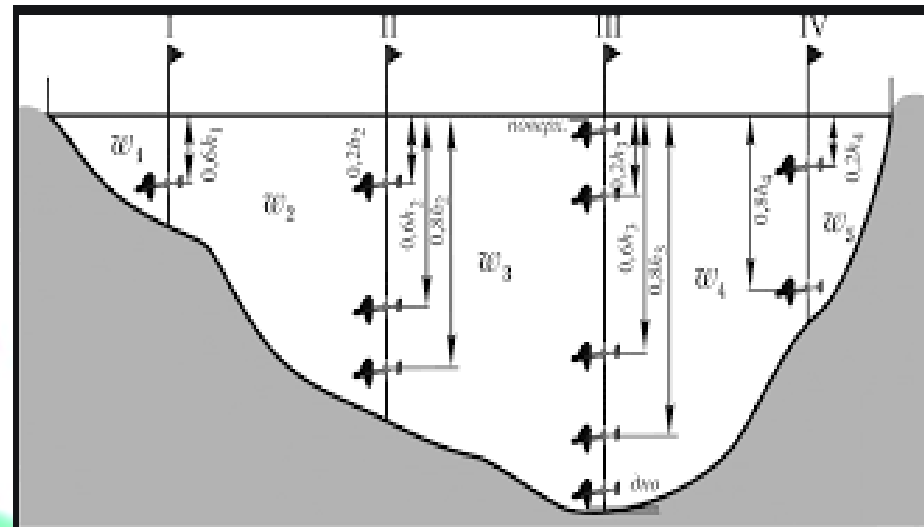
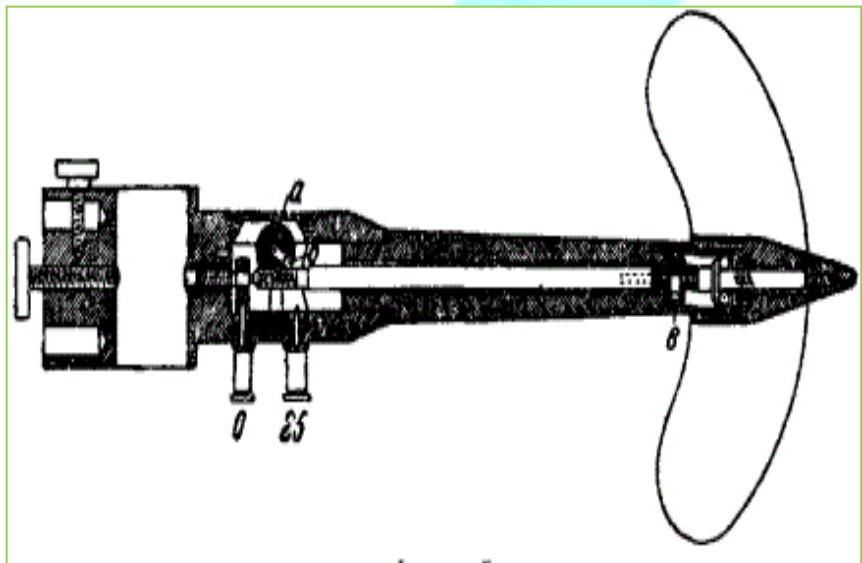
# Parrakning (rotorning) aylanishlar sonini hisoblashga asoslangan usul

Oqim tezligini o'lchash uchun eng keng tarqalgan asboblarda gidrometrik parraklardir. Ular, odatda, oqimning alohida nuqtalarida mahalliy oqim tezligini o'lchaydilar.



# Tezlikni gidrometrik parrak yordamida o'lchash parrakning 1 sekunddagi aylanishlar sonini aniqlashga asoslangan

Gidrometrik parrak suvning oqish tezligini jonli kesmaning istalgan nuqtasida o'lchash imkonini beradi.



# Gidrometrik parrak aylanish tezligi suvning oqish tezligiga bog'liqligi



Gidrometrik parrak suvning oqishi natijasida harakatga kelib va aylanish tezligi suvning oqish tezligiga bog'liq bo'ladi.

# Suvning oqish tezligini hisoblash ifodasi

Parrakning bir sekunddagi aylanishlari sonini aniqlab, suvning oqish tezligini quyidagi ifoda yordamida hisoblash mumkin:

$$V = V_0 + K \times n,$$

bu yerda:

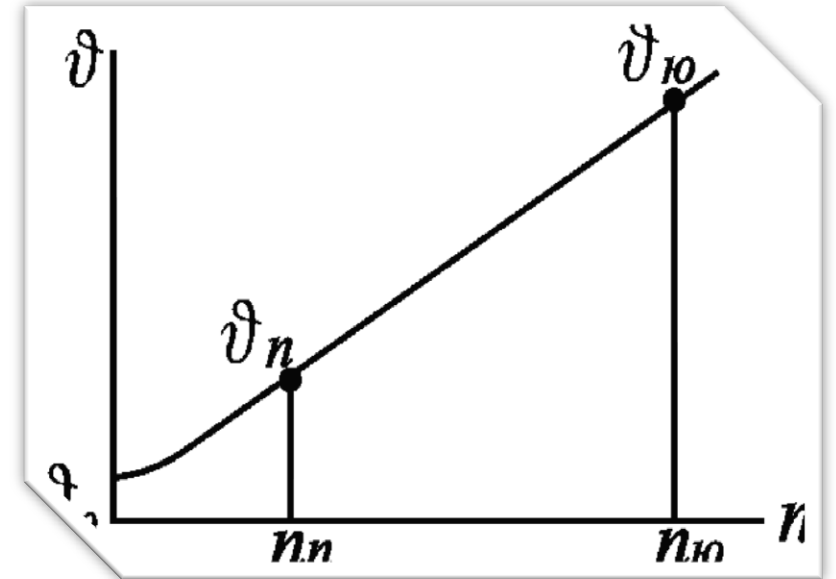
$V$ —suvning oqish tezligi, m/s;

$V_0$ -boshlang'ich tezlik, m/s;

$K$ -koeffitsient,

$n$ -parrakning 1 sekunddagi aylanishlari soni.

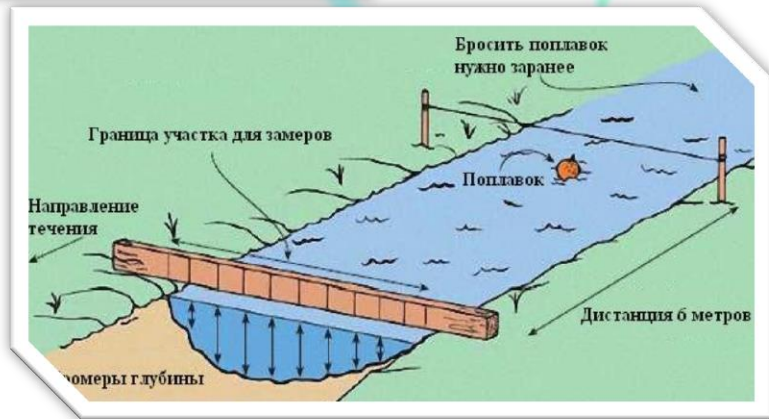
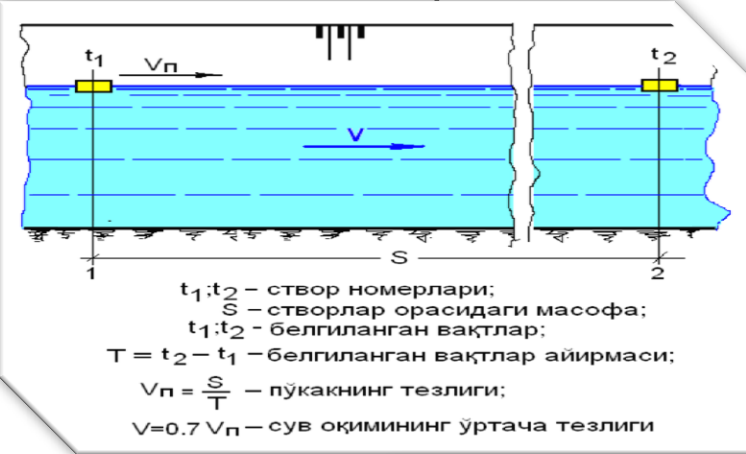
Ko'pchilik hollarda  $V_0 = 0,03 - 0,07$  m/s oralig'ida bo'ladi.



**Gidrometrik parrakning**  
 $V = f(n)$  **bog'lanish grafigi**

# Oqib ketayotgan jismning tezligini hisoblashga asoslangan usul

Tezlikni o'lchash uchun turli xil suzuvchi vositalardan (po'kaklardan) foydalaniladi, ularni kerakli chuqurlikka tushirilish mumkin.



Yuza po'kaklari



Рис. 5.3. Поверхностные поправки.

Chuqurlik po'kaklari

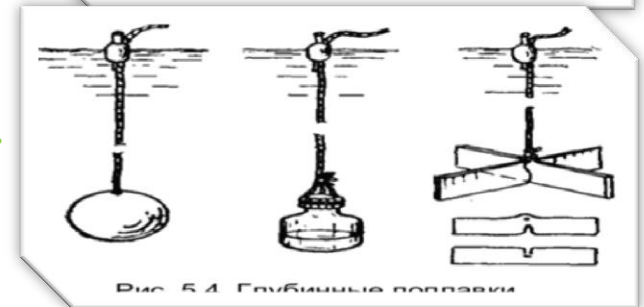


Рис. 5.4. Глубинные поправки

Integrator po'kaklar

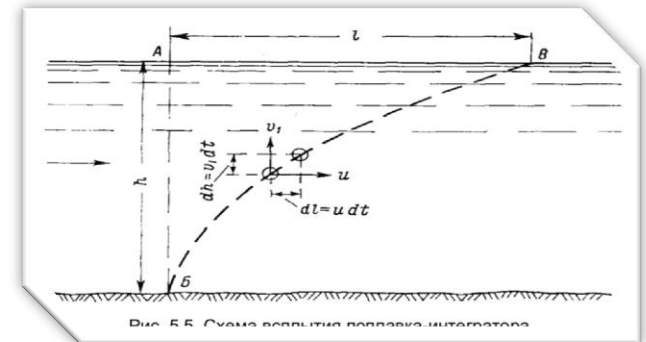
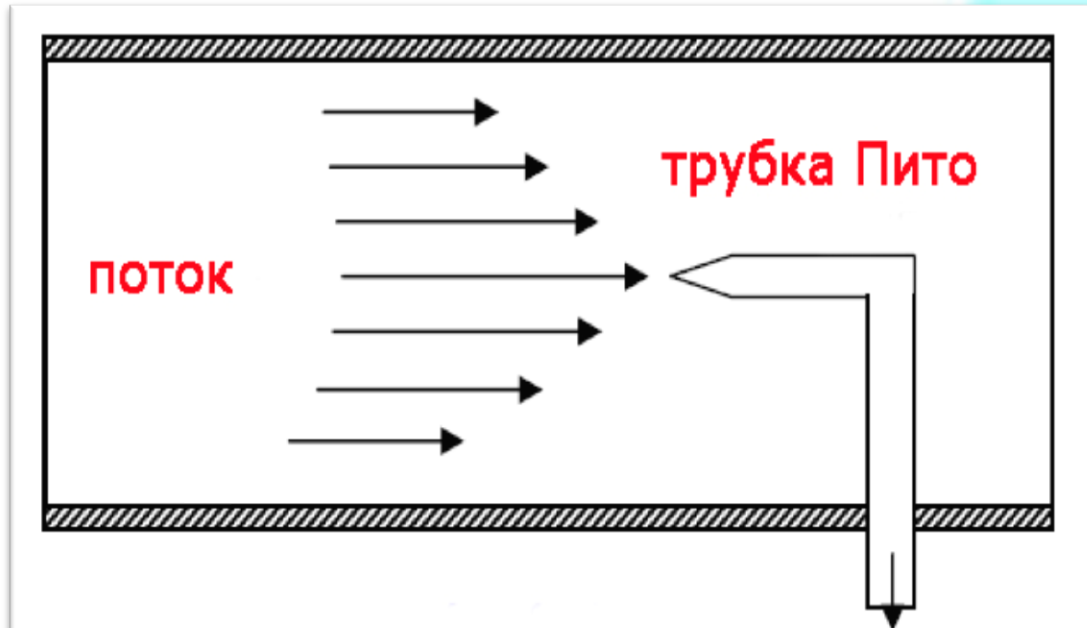


Рис. 5.5. Схема работы поплавка-интегратора



# Tezlik bosimini hisobga olishga asoslangan usul

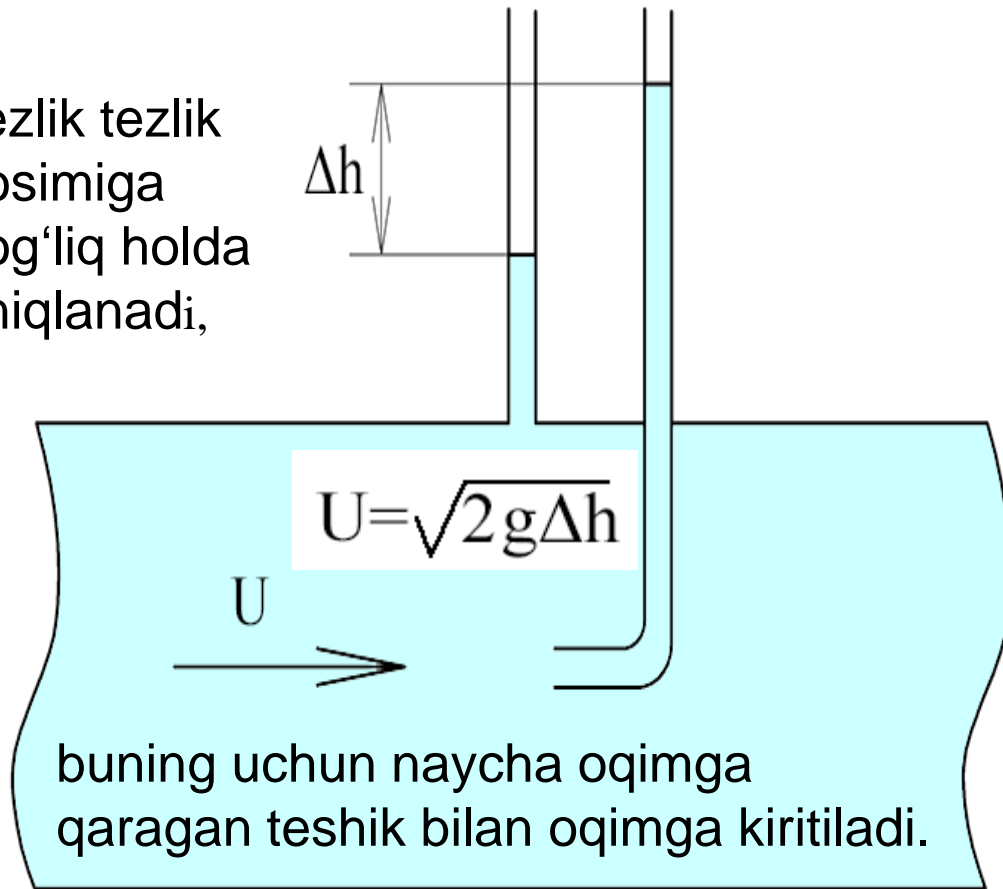


Tezlikni o'lchash uchun turli xil konstruktsiyalardagi gidrometrik naychalar ishlatiladi, ularning prototipi Pito trubkasi

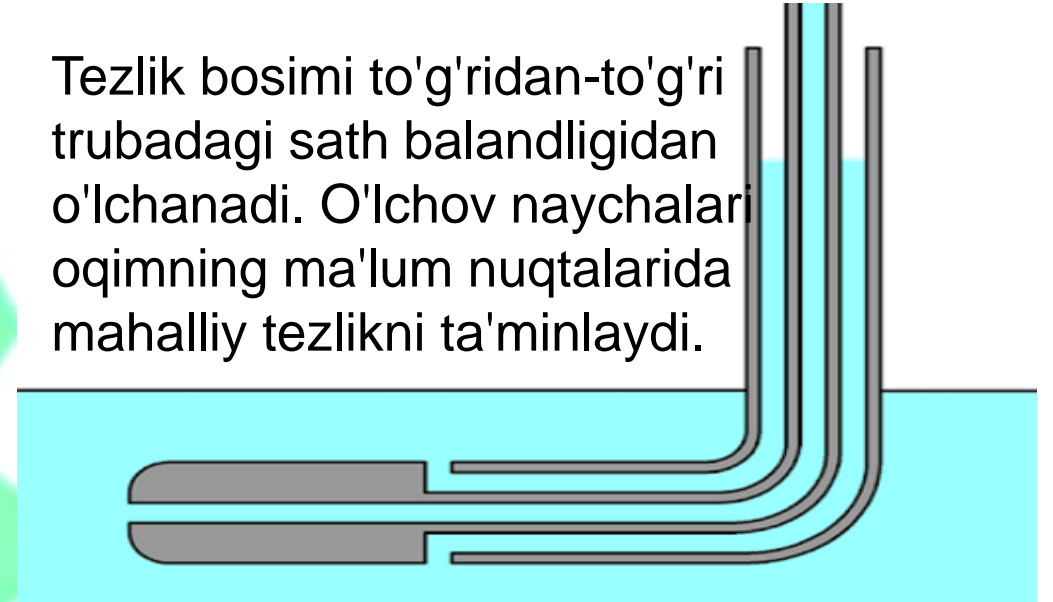


# Pito trubkasi

Tezlik tezlik bosimiga bog'liq holda aniqlanadi,



Tezlik bosimi to'g'ridan-to'g'ri trubadagi sath balandligidan o'lchanadi. O'lchov naychalari oqimning ma'lum nuqtalarida mahalliy tezlikni ta'minlaydi.



# Oqimning kuch ta'sirini hisobga olishga asoslangan usul

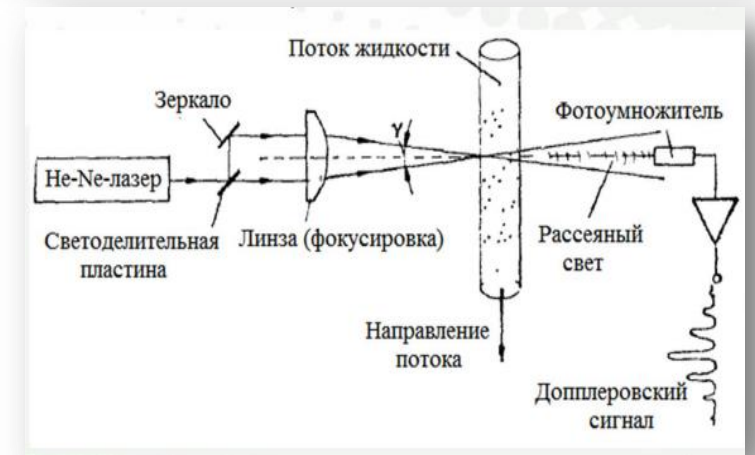
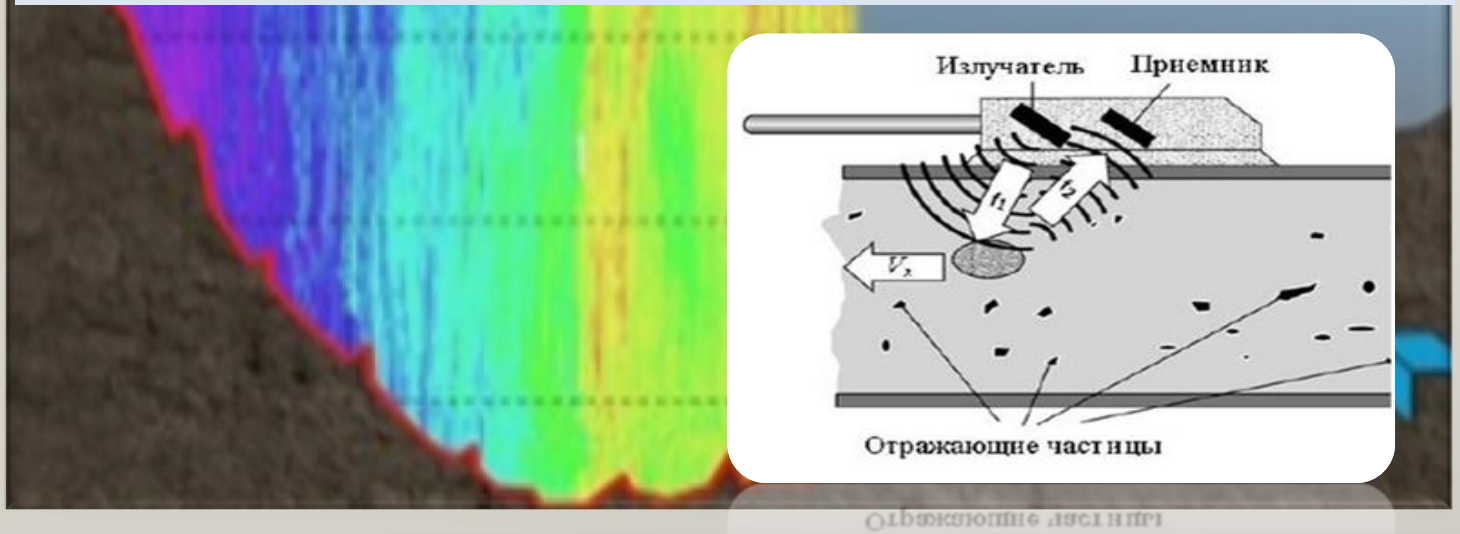
Tezlikni o'lchash uchun oqimning kuch ta'sirini sezadigan, sezgir elementi mavjud bo'lgan qurilmalar qo'llaniladi(tenzometr).



Ular tezliklarning pulsatsiyasini tekshirishga, oqimning alohida nuqtalarida tezlik qiymatlarini doimiy ravishda yozib olishga imkon beradi.

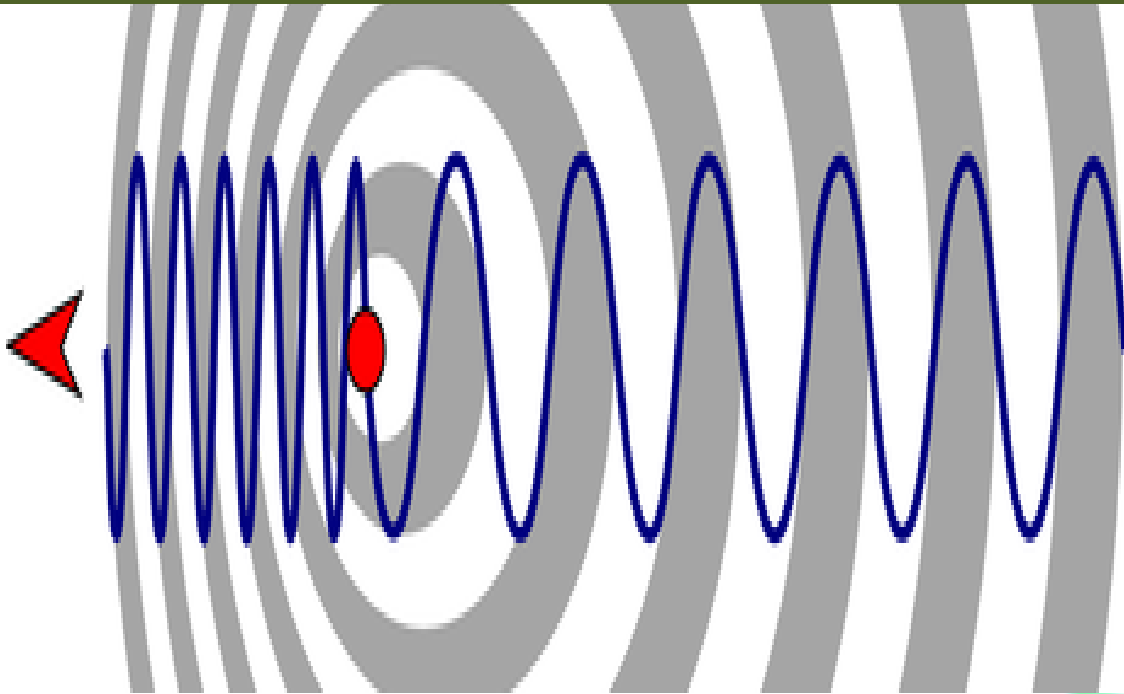
# Issiqlik almashuviga asoslangan usul

Tezlikni o'lchash uchun ishchi organ sifatida qizdirilgan elementga ega qurilmalar qo'llaniladi. Oqim tezligi sezgir elementning sovutish tezligiga qarab aniqlanadi: tezlik qancha yuqori bo'lsa, sovutish darajasi ham shuncha yuqori bo'ladi. Ushbu asboblarda tezlikni doimiy ravishda yozib olish bilan o'lchaydilar.



# Ultratovushni moslamalardan foydalanib tezlikni aniqlash usuli

Akustik turdagi o'lchagichlar oqim tezligini o'lchash uchun Doppler effektidan foydalanadi.



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