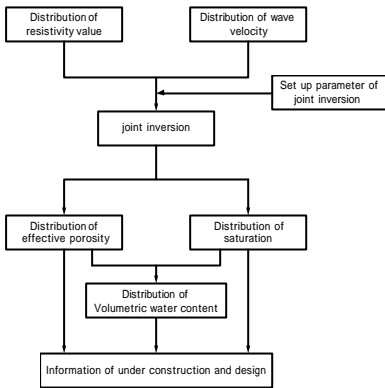


Estimation Method of Rock Masses of Tunnel Construction by Joint Inversion Method using Seismic Velocity and Resistivity

Summary of joint inversion



Equation of joint inversion

Equation of Wylie

$$\frac{1}{V_p} = \frac{(1-S_r)}{V_m} + \frac{S_r}{V_f} + \frac{(1-S_r)}{V_a}$$

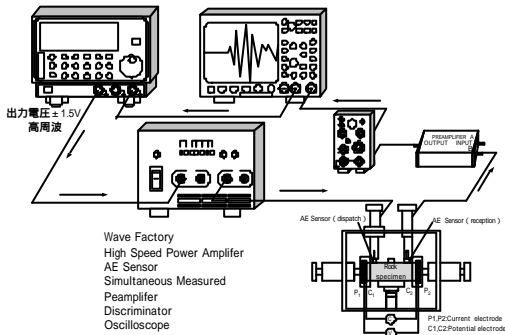
V_p : velocity of rock mass, V_m : velocity of borehole core, V_f : velocity of water, V_a : velocity of air, S_r : effective porosity, S_r : saturation

experimental Equation

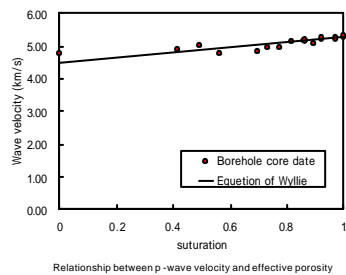
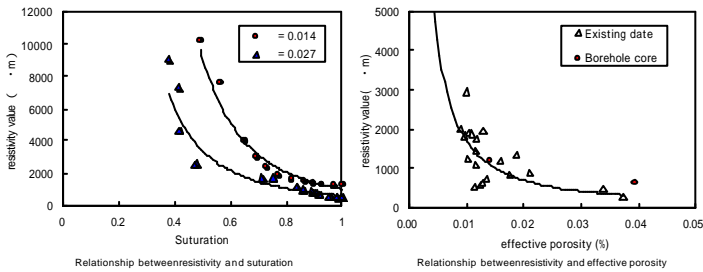
$$= m \cdot S_r^{-B} \cdot \rho^{-n}$$

resistivity value, m, n, B : coefficient

Measuring system of borehole core

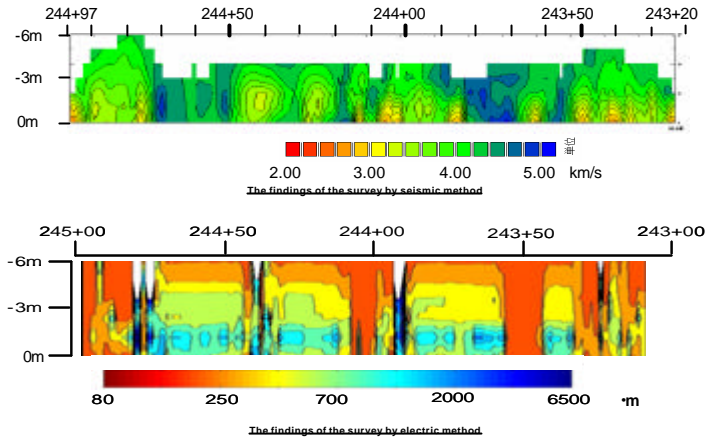


Set up parameter of joint inversion

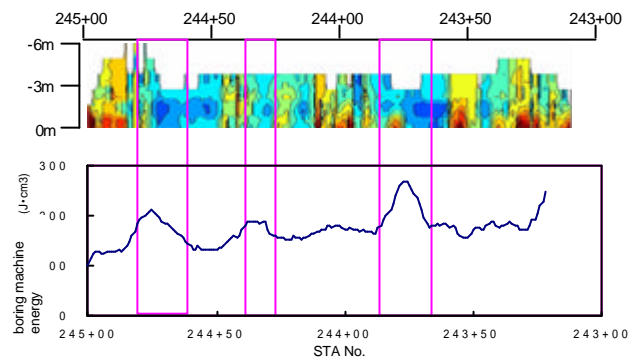


joint inversion parameter		
joint inversion coefficient	m	4.23
	n	1.3
	B	2.63
wave velocity of rock mass	V_m	5500m/sec
velocity of water	V_f	1500m/sec
velocity of air	V_a	330m/sec

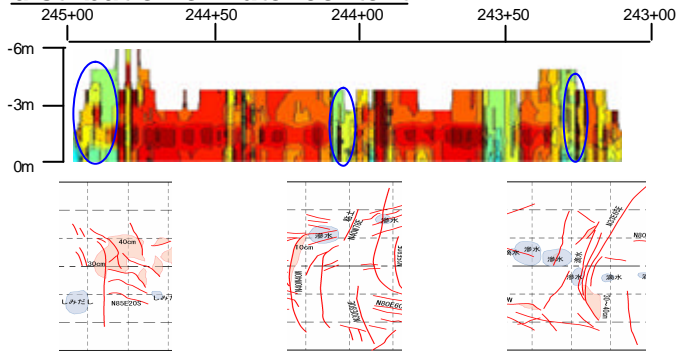
The findings of the survey by seismic method and electric method



Comparing boring machine energy with distribution of porosity



Comparing water point with volumetric distribution of water content



Comparing support of tunnel construction with distribution of porosity

