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GEOPHYSICAL INVESTIGATION OF EASTERN ROMAN EMPIRE'S GREAT PALACE'S PITTAKIA SECTION, ISTANBUL, TURKEY

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Pittakia is a document library section of the Eastern Roman Empire's (ERE) great palace, taking place at eastern side of Saint Sophia museum. Initation of excavation resulted with discovery of galleries and glorious wall painting. To find extension of such findings, multidisiciplinary geophysical study, consisting microgravity, vertical gradient, magnetics and gradiometry, shallow TEM conductivity (EM61) and GPR were run at 6300 stations with maximum station interval of 50cms.

Constuction materials are bricks, limestone and sandstone. Widths of corridors are about 1.5 to 2.5 meters, and heights are about 6 to 9 meters. Some of them are empty, some are filled with remanants of destracted other later building materials, which has higher magnetizations.

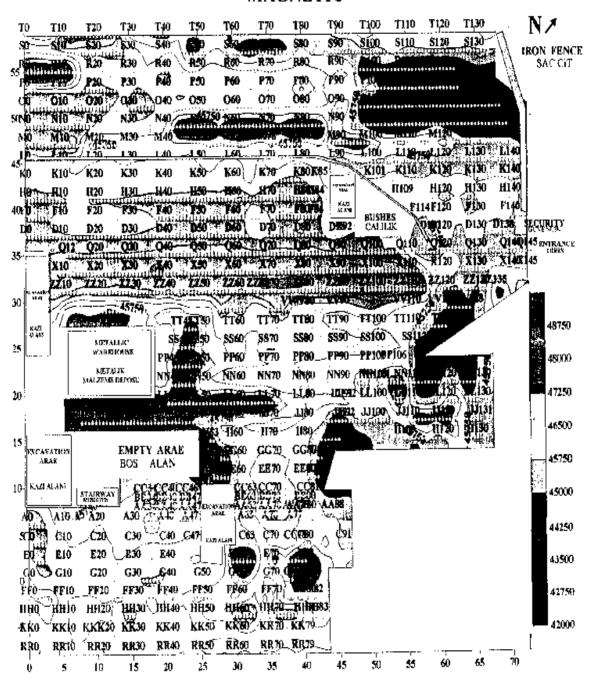
If inside galleries are empty, they are recognized with low magnetic anomalies, with magnitude about -1000 to-1300 nT/m and magnitude of microgravity anomalies are about -25 to -150 μ gal and vertical gradients is about -50 to 80 μ gal/m. four channel EM61 was successfull to locate metalic objects clearly. Interpretations revealed that dominant extent of structures is in EW direction and depth to the bottom is 9 to 12 meters.

In conclusion, surface geophsics has accomplished to clearify surface projection of hidden structures of Pittakia section of ERE great palace.

GRAVITY	MAGNETIC			
	Gravity Anomaly µgal	Gradient dg/dz µgal/m	Total Field Gamma(γ)	Gradient dT/dz γ/meter
x y z 8 x 8 x 9 m Excavated Pit	(-125)-(500)		-2800	
Empty Gallery	(-25)-(-150)	(-50)-(80)	(-1600):(-2000)	(-100)-(1300)
Filled Gallery		0		0
Mean Value	4948526	0	46200	0
Daily Variation	500 250		1000	

BYZANTINE PALACE ARCHEOGEOPHYSICAL MAP

MAGNETIC



YERALTI ARAMACILIK 17.09.1998 ISTANBUL - TURKEY Magnetik Measurement Station C
St

1 meters P
0 5 10

Counter Interval = 750 gamma Station Interval = 0.5 meters Profile Interval = 1 or 2 meters