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## Investigation of Disturbance on Gallery Floor of Hagia Sophia Museum with GPR Method

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### SUMMARY

The Hagia Sophia Museum has an important place in both Byzantine and Turkish history, which was constructed by Emperor Justinian in 532 – 537 AD. After get over many large earthquakes and disasters, the Hagia Sophia Museum has maintained its existence until nowadays with repairs and renovations at various times.

In this study, the crack in the Gallery floor ground and the condition of the vaults, which are located between Gallery floor and the main hall of the Hagia Sophia Museum were investigated by GPR (Ground Penetrating Radar) method with 1 GHz HF (High Frequency) antenna.

The obtained data revealed quite clearly, the deterioration in the vault structure located under the Gallery floor. In the same time it has also revealed the work to strengthen the reinforced metal system made at this level. GPR results showed that, the strengthening work larger than the strengthening work mentioned in many older sources at the Hagia Sophia Museum, and these new results contribute to the future static studies. After this successful GPR study, the new project on the walls and the basements of the Hagia Sophia Museum was started with GPR and GPR-CX (Ground Penetrating Radar – Concrete Exploration) methods.

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