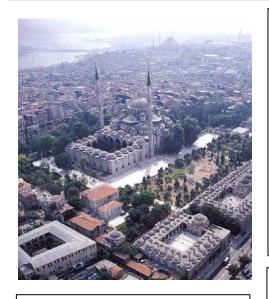
SPECTRAL ANALYSIS FOR FATIH SULTAN MEHMET MOSQUE



AIM OF THE STUDY

- **1.** To determine the frequency corresponding to the first mode of the structure
- **2.** Investigate the effect of temperature on the results obtained
- 3. Describe spectral analysis techniques used in civil & earthquake engineering applications
- **4.** Discuss about the change in the level of excitation during the day in ambient vibration analysis

METHODOLOGY

- **1.** Visual inspection of the spectrum obtained from acceleration time history
- **2.** Determination of the governing period from displacement time history
- **3.** Visual inspection of the spectrum obtained from displacement time history
- **4.** Comparison of the frequencies in east-west and north-south direction using particle motion
- **5.** Verification of the results using the earthquake record taken on 20.12.2005

RESULTS

Frequencies Corresponding to the First Mode of the Structure

	Date			
	27 Ocak $(-3.2^{\circ}C)$		22 Mayis $(30.3^{\circ}C)$	
Resolution	E-W	N-S	E-W	N-S
512	2.534	2.55	2.425	2.534
1024	2.566	2.555	2.409	2.534

- The structure has an average frequency of 2.5 Hz both in east-west and north-south direction
- Temperature increase causes decrease in the frequencies
- East-west direction is susceptible to temperature changes compared north-south direction
- Earthquake record analysis verify the ambient vibration analysis results
- The level of excitation remain to be same throughout the day

