



# Time Series of GPS stations in the Near East

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- Only a few studies about geodynamics by GPS of the Eastern Mediterranean, the Arabian, and the Near East areas are existing
- Affiliations to different micro plates of GPS stations in the Eastern Mediterranean area are not known exactly
- Similarities in the coordinate time series of nearby GPS stations are detected
- Analysis of common movements are required
- The reasons for and the consequences of potential periodic effects have to be analysed, especially in the frequency domain













• GPS stations from the extended EUREF monitoring network processed by the OLG Graz

COUNTRY	CODE	]	COUNTRY	CODE
Austria	GRAZ	1	Republic of Armenia	NSSP
Bahrain	BAHR	1	Romania	BUCU
Bulgaria	SOFI	1	Russia	ZECK
Cyprus	NICO	Saudi Arabia Turkey	HALY	
Greece	AUT1		Saudi Arabia	NAMA
	IGD1			SOLA
	TUC2		Turkey	ANKR
Iran	TEHN			DYR2
Israel	DRAG			ISTA
	RAMO			MERS
Jordan	AMMN	1		TRAB
Lebanon	LAUG	1		TUBI
Macedonia	ORID	]	Ukraine	CRAO
Oman	YIBL	]		

• Data taken from GPS week 1107 (2001-03-25) to GPS week 1315 (2005-03-26)







### **Data preparation**





- Localisation and elimination of personal faults (example: wrong antenna height in Halat Ammar)
- Combined plots of the coordinate differences (4 to 6 neighbouring stations together)







#### **Time series**





• The coordinates of Ankara drift (more or less linear) in a westward direction; they follow complete different characteristics than the stations in the surrounding area









#### **Time series**







♦ CRAO ♦ NSSP ♦ TRAB ♦ ZECK



#### **Time series**





- All stations follow the characteristics of a sawtooth with the maxima in spring
- The Saudi Arabian stations have a larger amplitude than the Israeli ones

- All stations have the same characteristic of movements in the Up component
- Unfortunately no data of the Saudi Arabian stations before GPS week 1259 have been included yet













• The time series of the analysed stations show that all of the stations have similar movements in the three test areas. It can be assumed that there are no separately moving blocks. The transition zones should be investigated by a denser network

 Ankara seems to be isolated at the Anatolian plate, because the movements of the sourrounding stations all show other characteristics

• All stations follow periodic effects with the maxima in spring, especially in the North and Up component.











- More (later) data are required to compensate the late beginning of most of the GPS stations. Especially the data of AMMN, TEHN and YIBL are needed because they seem to be very interesting to analyse to get a better boundary information
- Periodic effects have to be analysed carefully (air pressure, moisture, oceanic effects)
- Analysis in frequency domain will be done to be able to recognize periodic effects which are not visible in the time domain
- It is planned to apply filters to eliminate high or low frequencies to be able to analyse the remaining frequencies carefully









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## Thank you for your attention!



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