# Human Cardiovascular Health Outcomes and Changes in the Earth's Local Time Varying Magnetic Field

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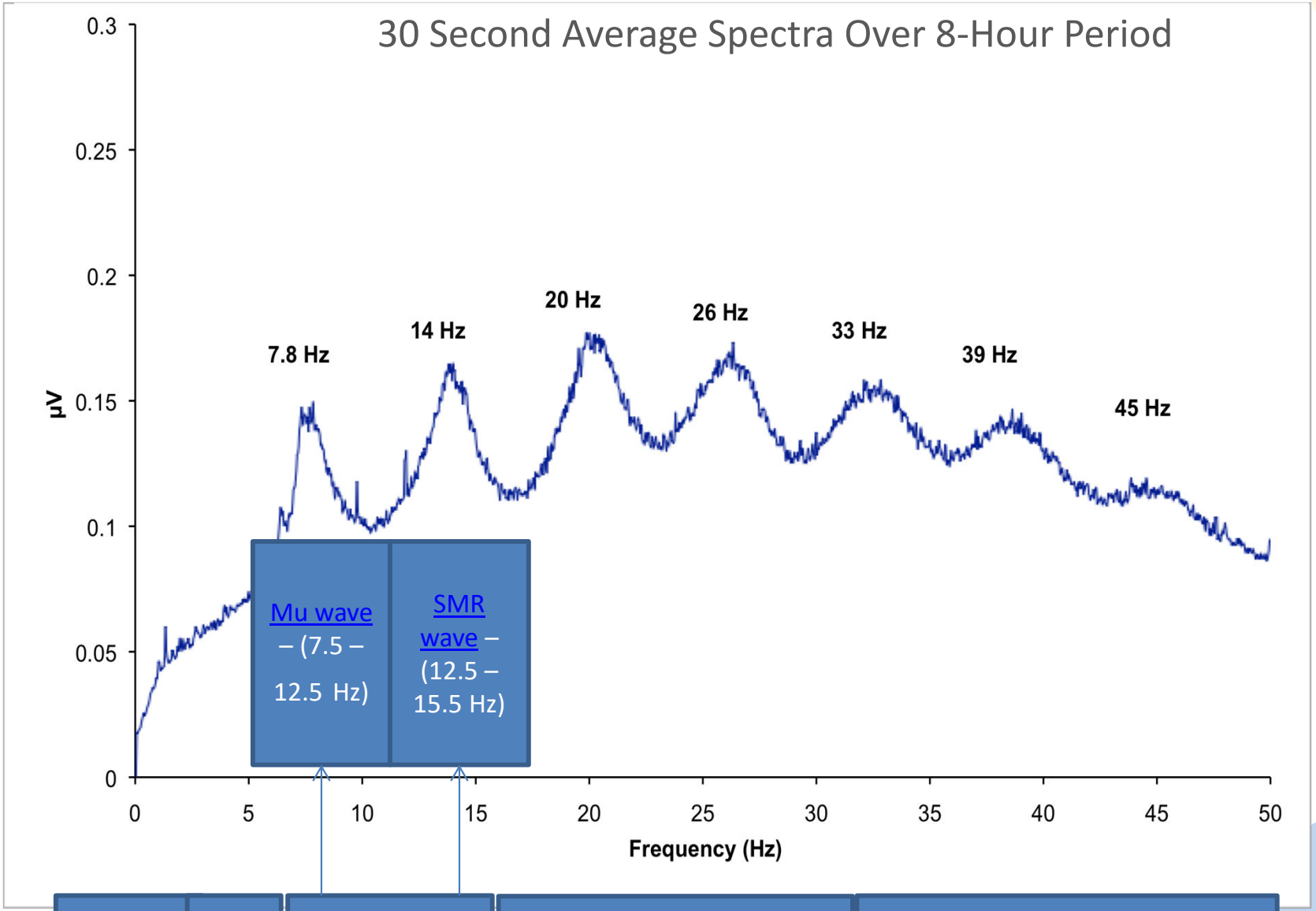
# Schuman Resonances

- German physicist Schumann was the first to investigate the features of magnetic field fluctuations that occur in the cavity between the surface of the Earth and the ionosphere.

- The resonances that have been identified are low frequency electromagnetic fluctuations which are closely related to human physiologic processes.

GŽ2

# Schumann Resonances (SR)



**GŽ2** Schumann

Greta Žiubrytė; 19.03.2019

# Earth's Magnetic Field

- Numerous studies have investigated the correlations between incidents of myocardial infarctions, high blood pressure and disturbances in the Earth's magnetic field

- It has become clear that interactions between Schumann Resonances can modulate Electroencephalogram (brainwave) activity. This means that changes in SR can influence on our sympathetic and parasympathetic activity.

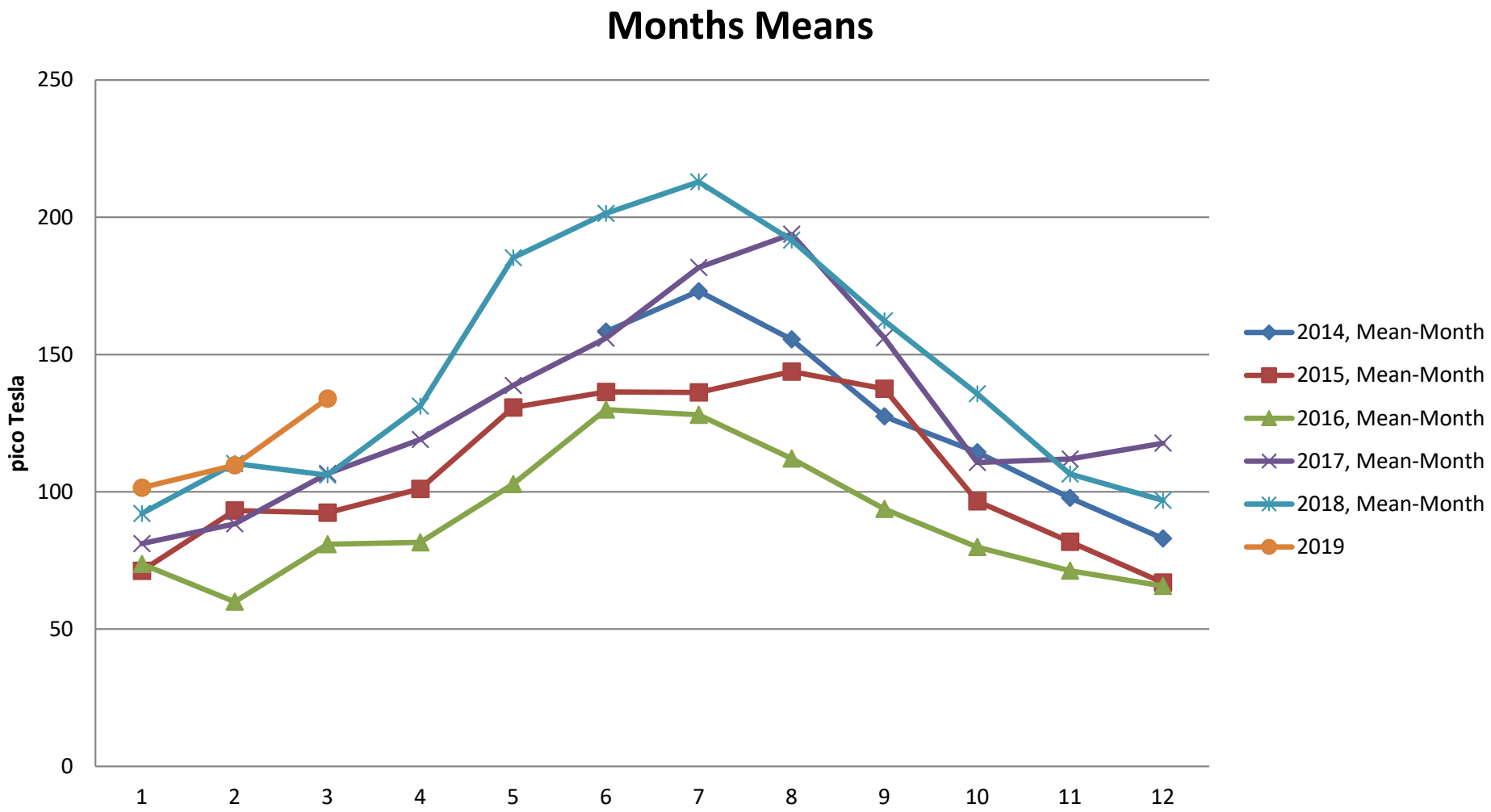
# Schuman Resonances

- SR data were obtained from a very sensitive magnetometer (sensitivity is in pico Tesla level) installed in Lithuania.

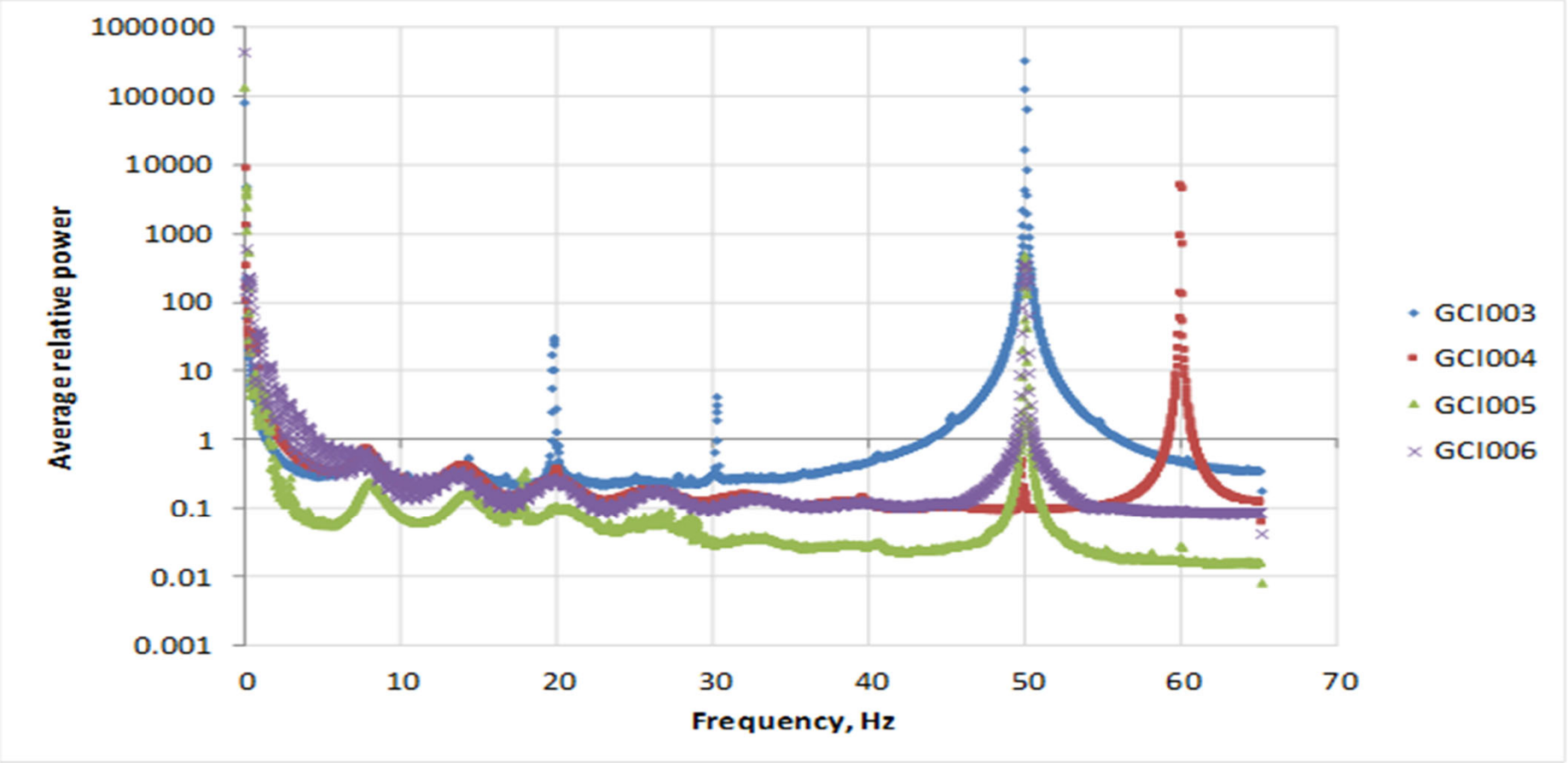
- This monitoring site for local magnetic field is part of the Global Coherence Monitoring Network that currently consists of 6 magnetometers located around the planet. Data from the global network of magnetometers can be found at:

- https://www.heartmath.org/research/global-coherence/gcms-live-data/

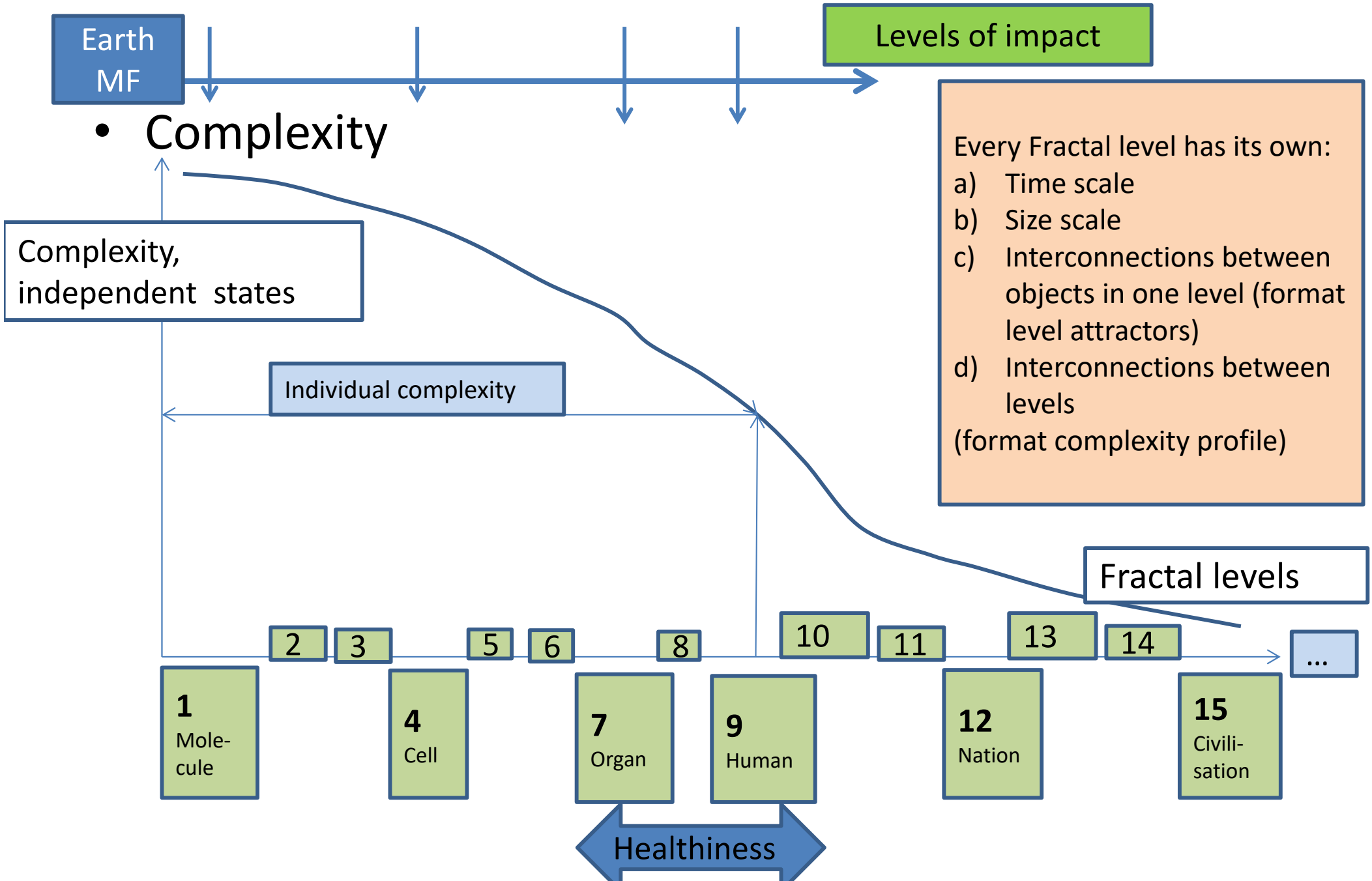
# Schumann Resonance Changes in 0.32 to 36 Hz Band Between 2014 to 2019



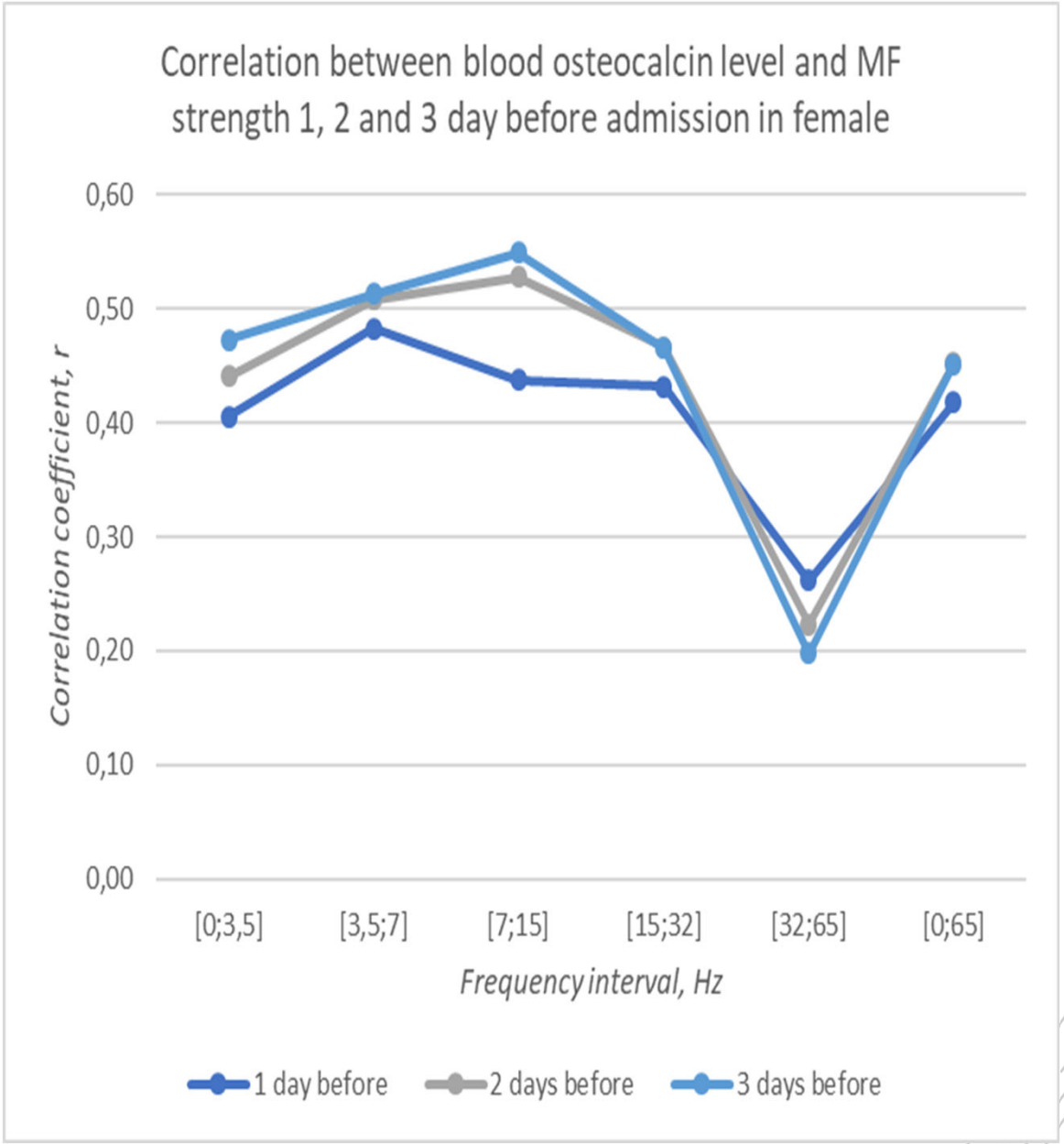
# Schumann resonances in Lithuania, Canada, New Zealand and South Africa



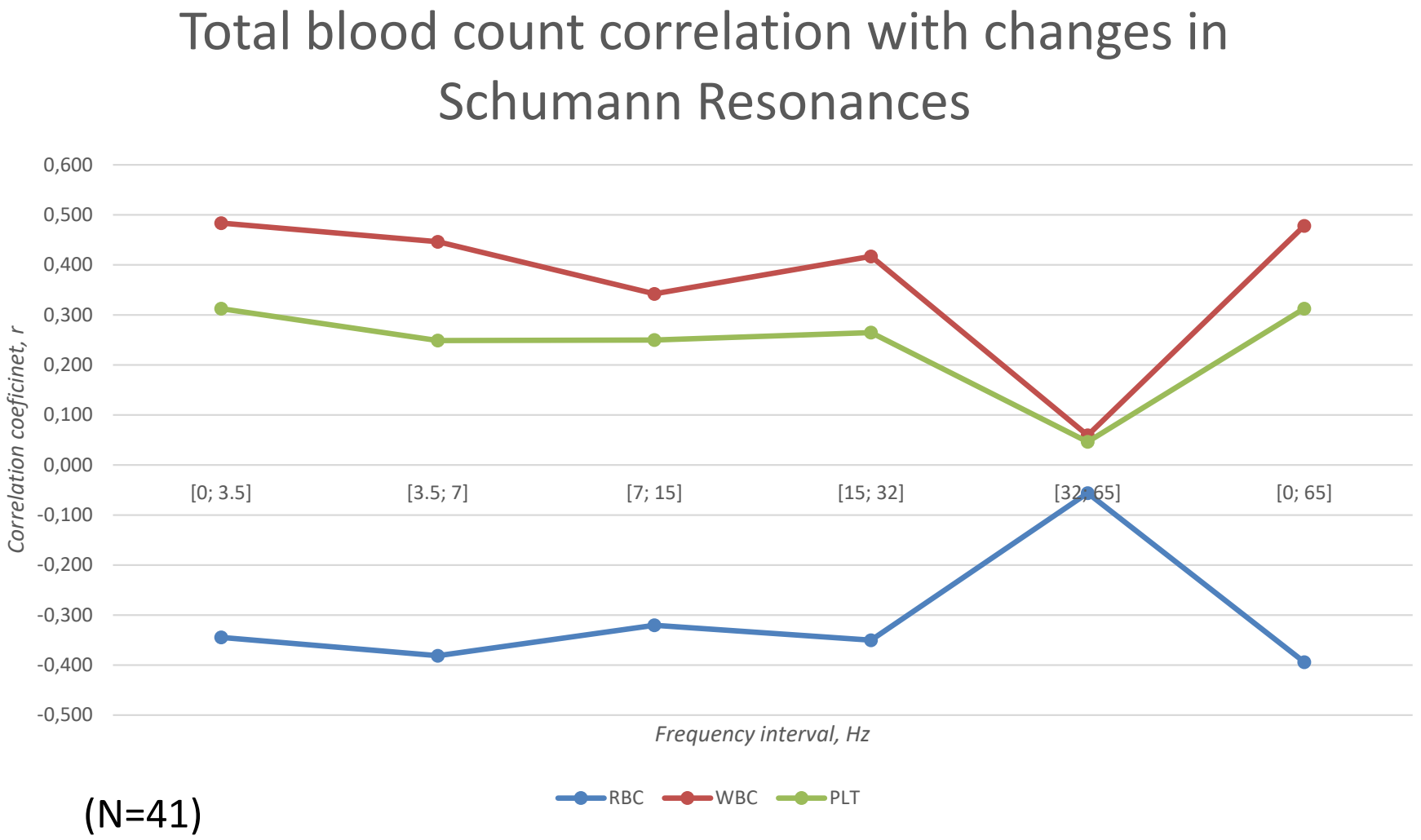
# Profile of complexity(according Y. Bar-Yam, NECSI, MIT)



Correlation between serum osteocalcin level and changes in the local Earth's magnetic field 1, 2 and 3 days before admission in females (N=41)

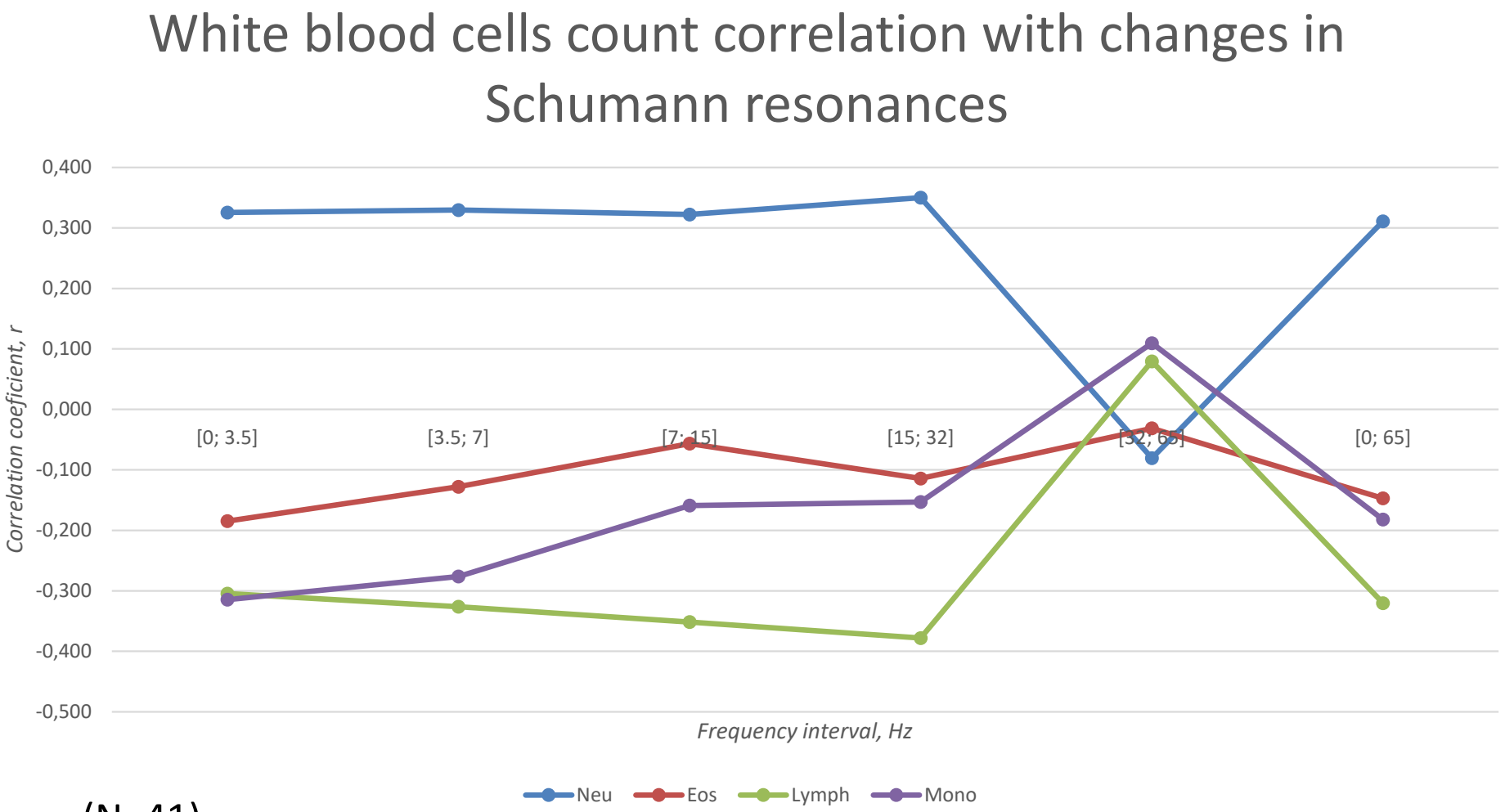


# Correlation Between Total Blood Count and Changes in Magnetic Fields in Females 1



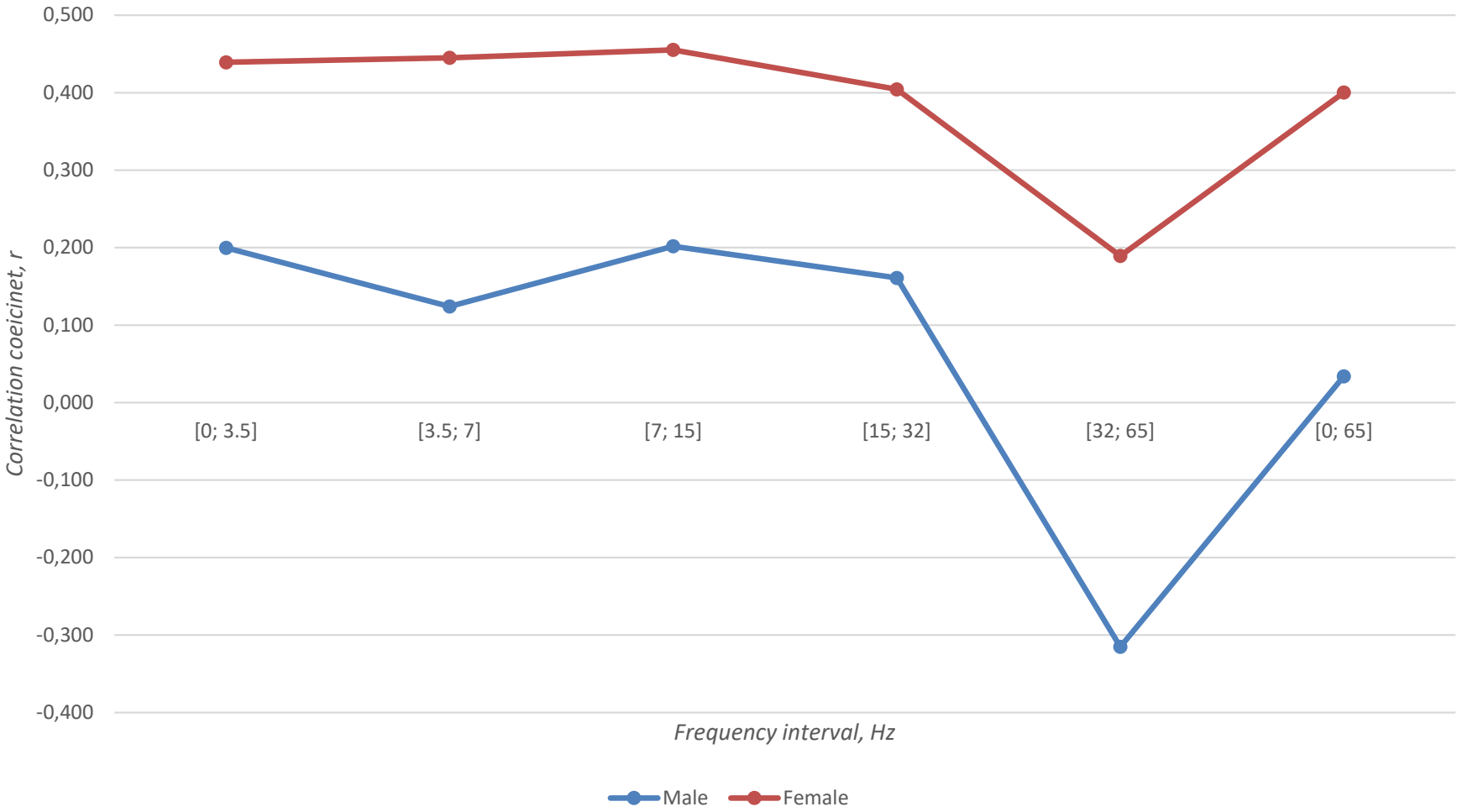

(N=41)

# Correlation Between Total blood Count and Changes in Magnetic Fields in Females 2




(N=41)

# Correlations Between Serum Calcium Level and Changes in Magnetic Fields

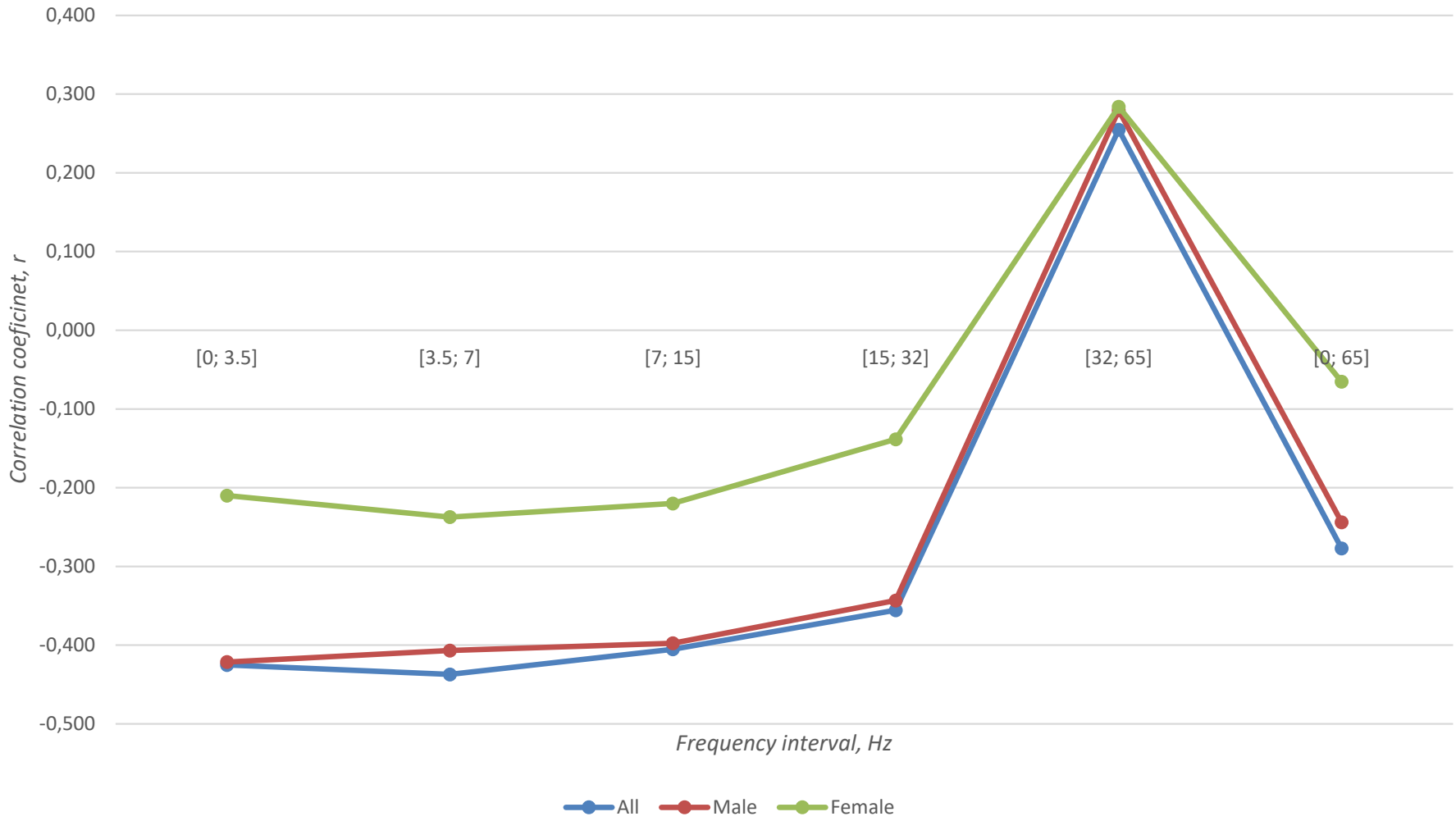



(Female N=41, male N=86)

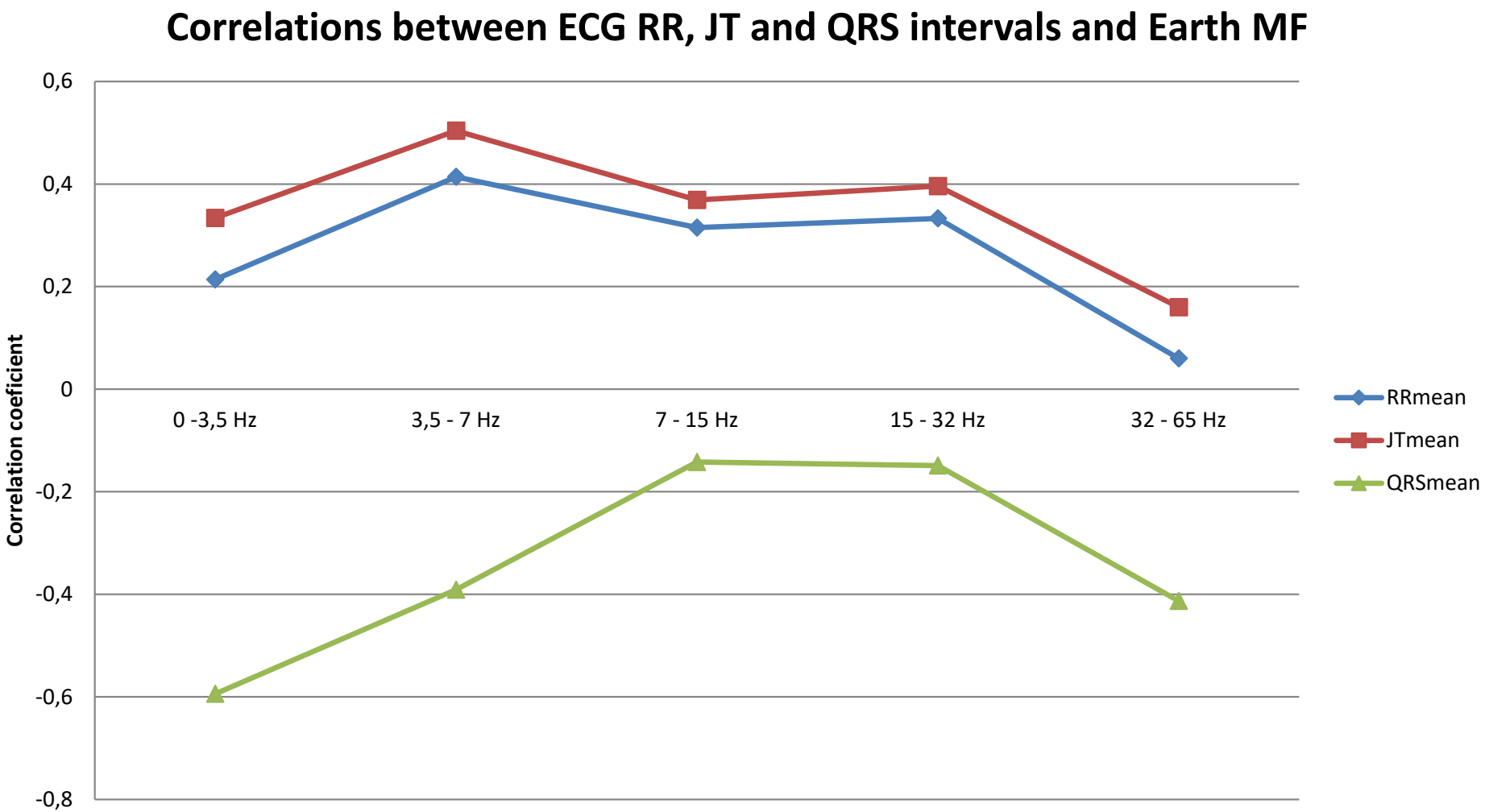
# Correlations Between Serum Phosphorus Level and Changes in Magnetic Fields


(N=127)

# Correlations Between Serum Cl/Na Ratio and Changes in Magnetic Fields

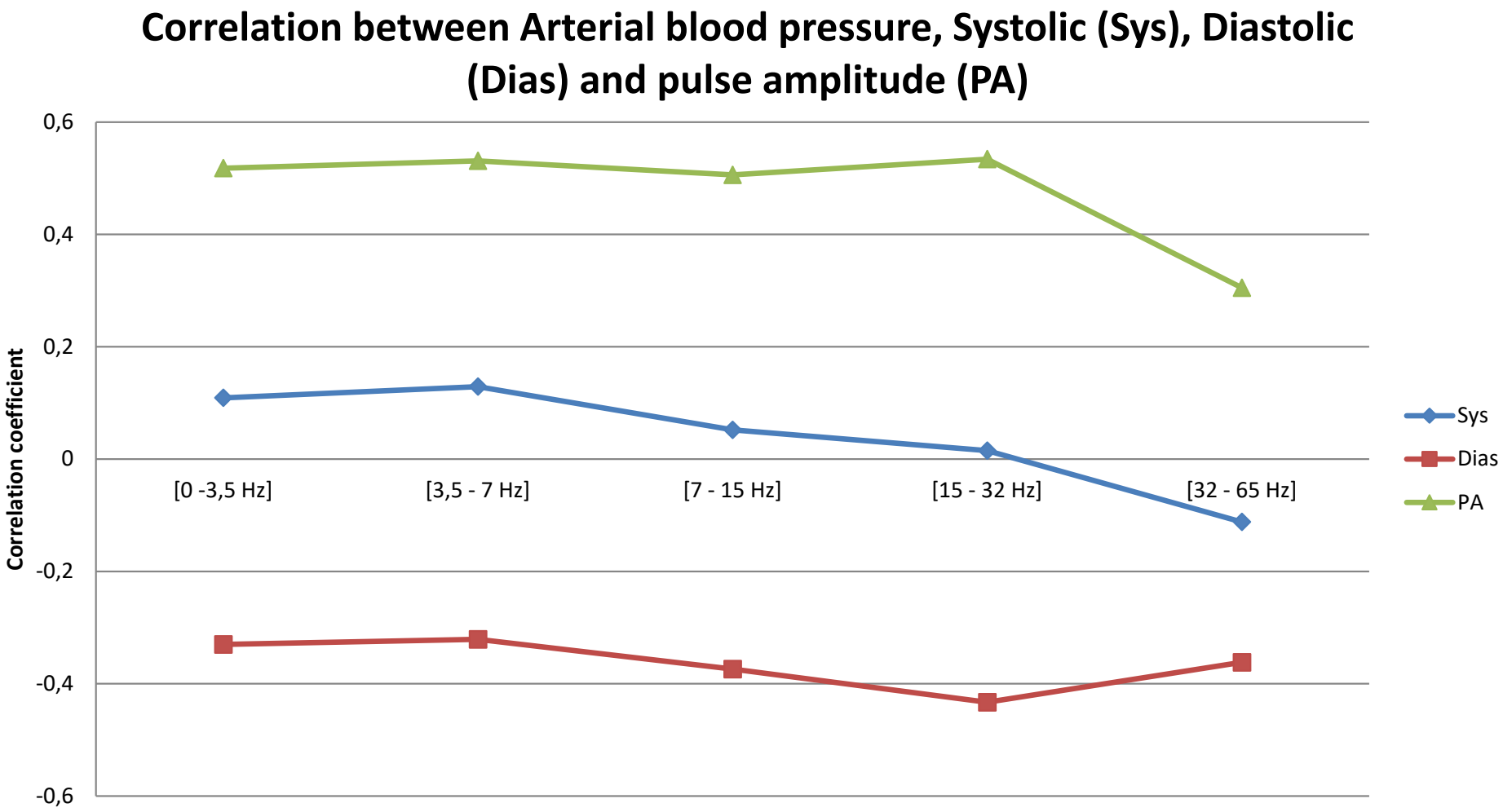


# Correlations of ECG Parameters and Earth Magnetic Fields Power



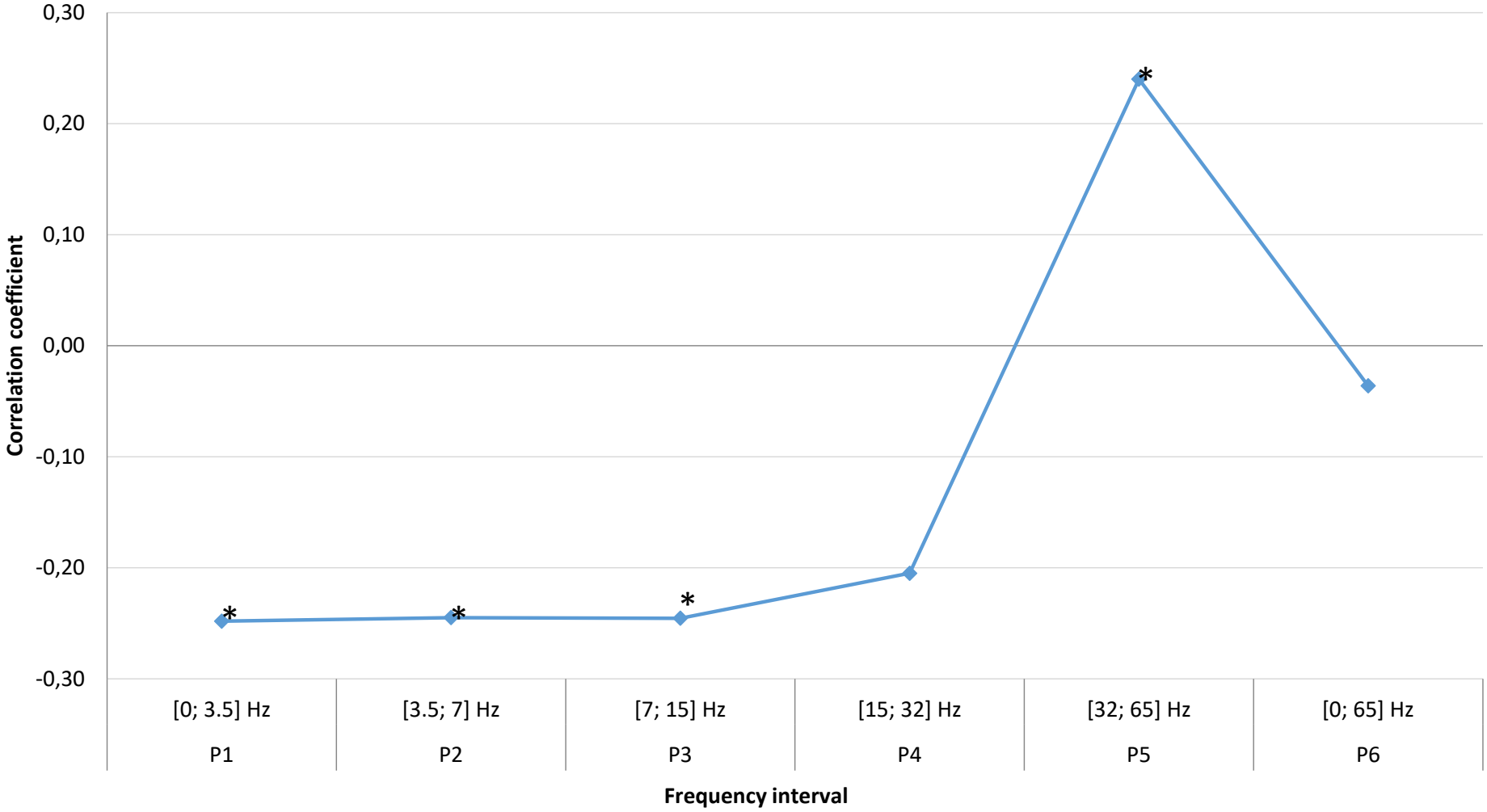

(Female, N=20)

# Correlation Coefficient Between Arterial Blood Pressure and Magnetic Fields




(Female, N=20)

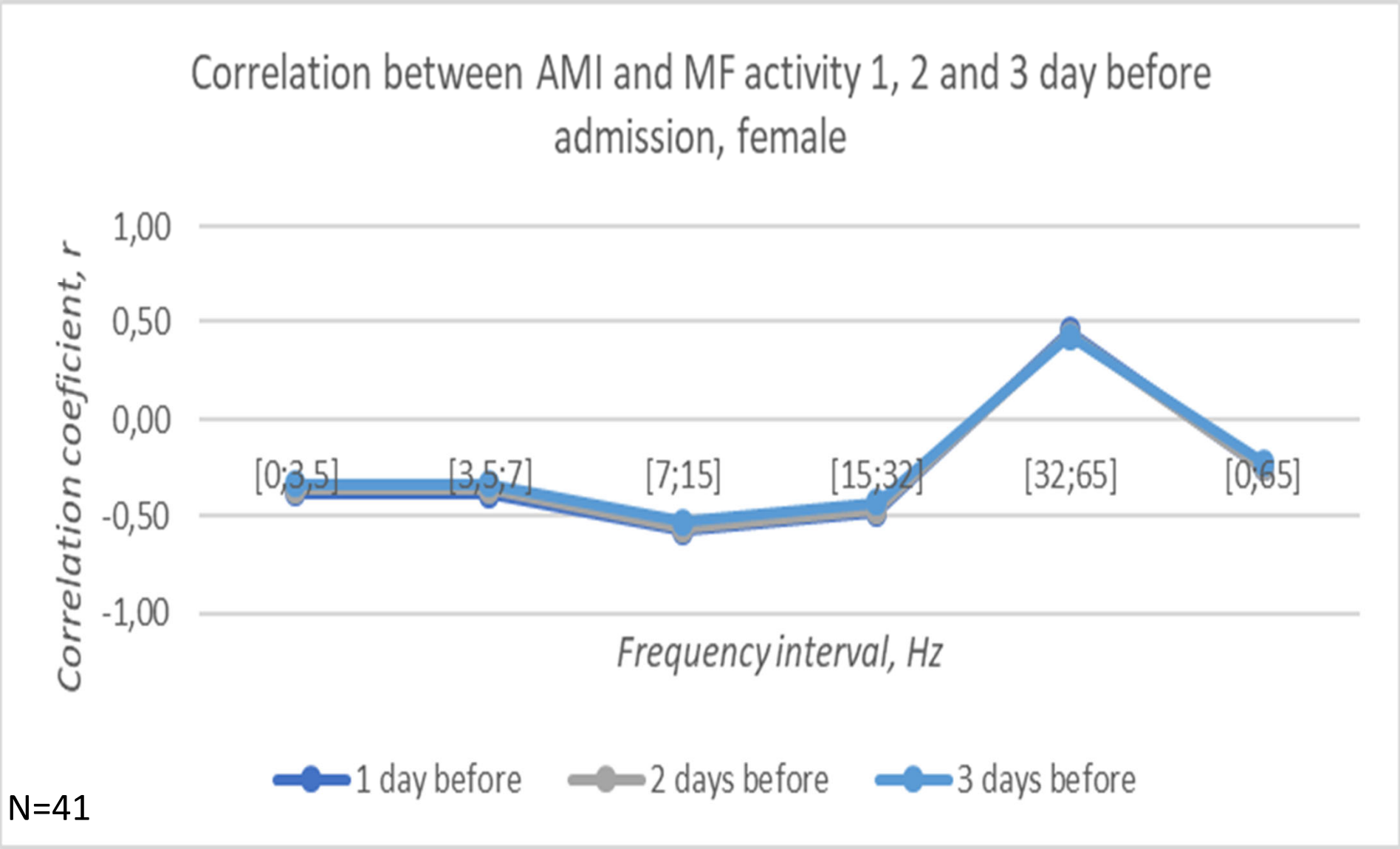
# Correlations: Number of weekly MI Admissions and Magnetic Feld Data



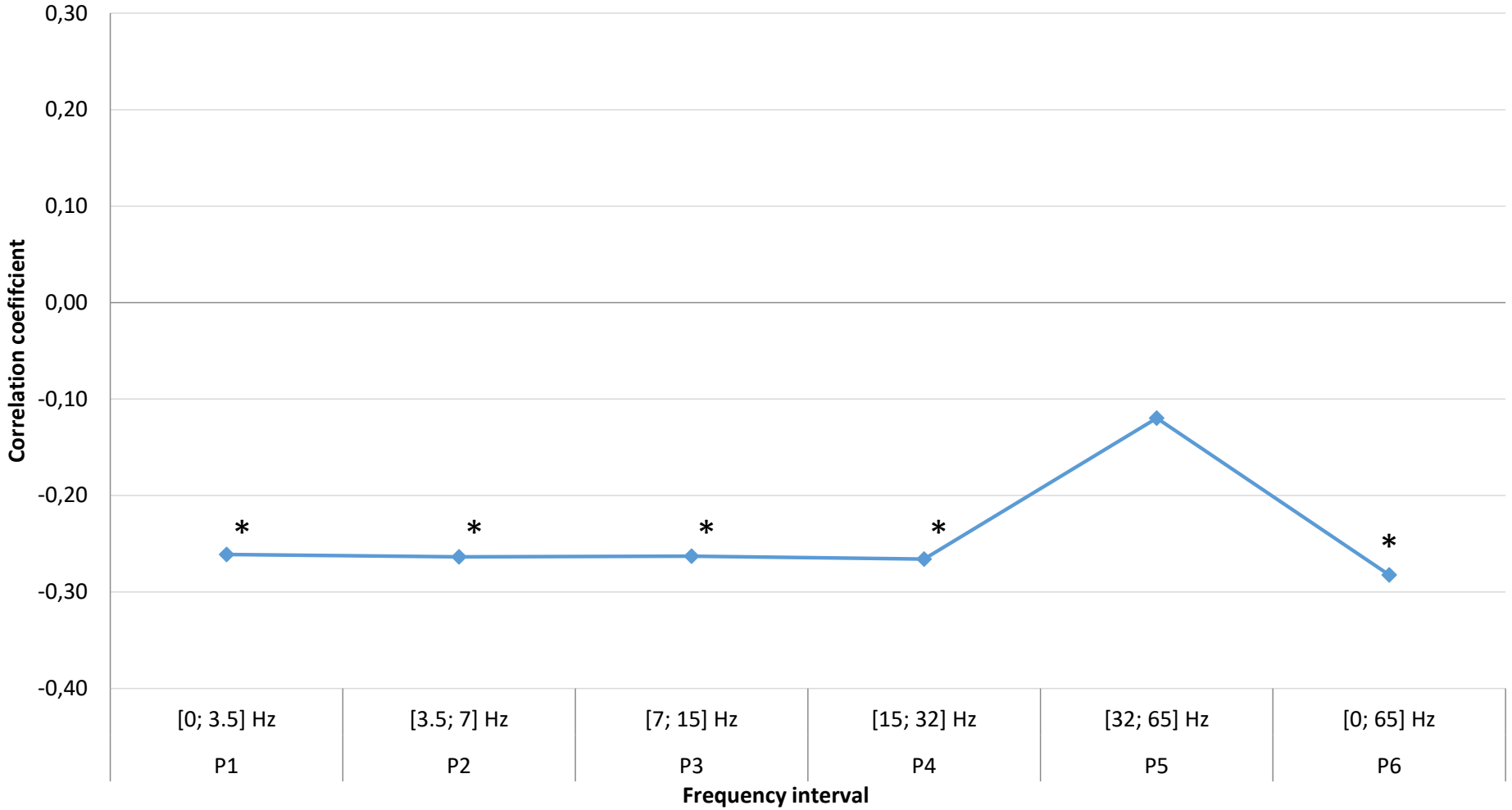

N=268 women, one week

Data from LUHS, Cardiology clinic, 2016) *p<0.05.

# Correlation Between Magnetic Field and AMI, Delay Effects



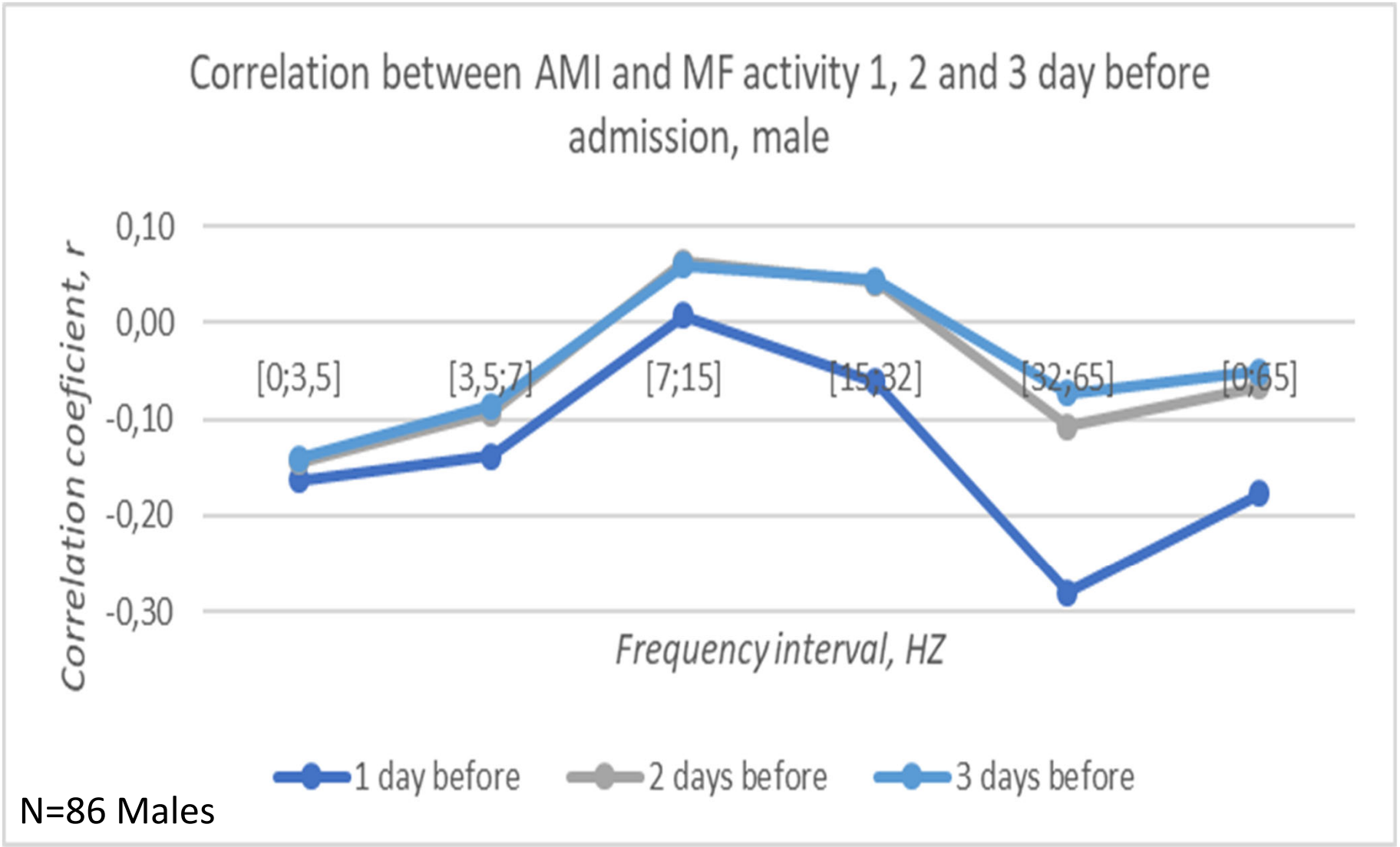
# Correlations Between MI Admissions and Magnetic Power in Different Frequency Ranges in Men



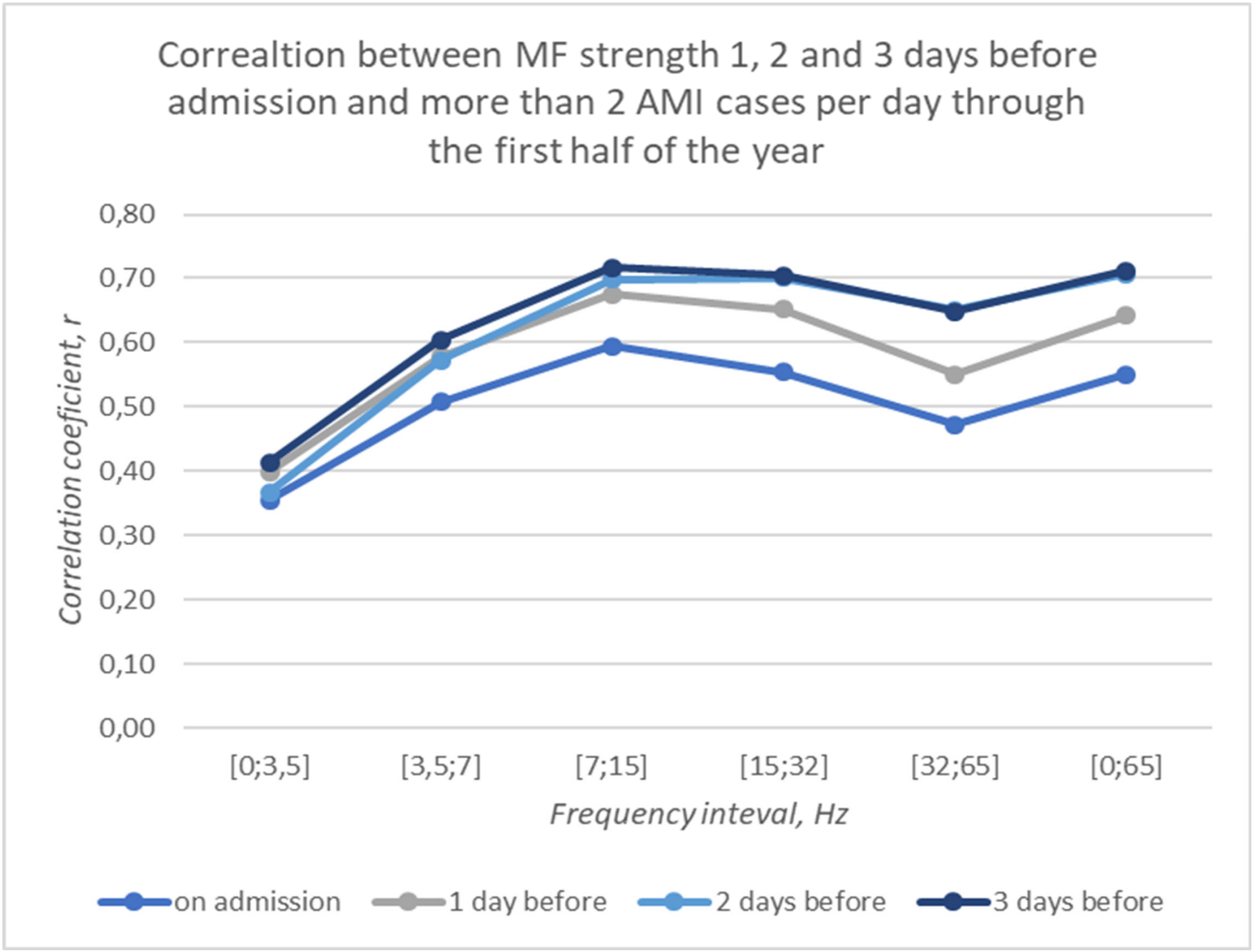

N=435 one week

data from LUHS, Cardiology clinic, 2016, *p<0.05.

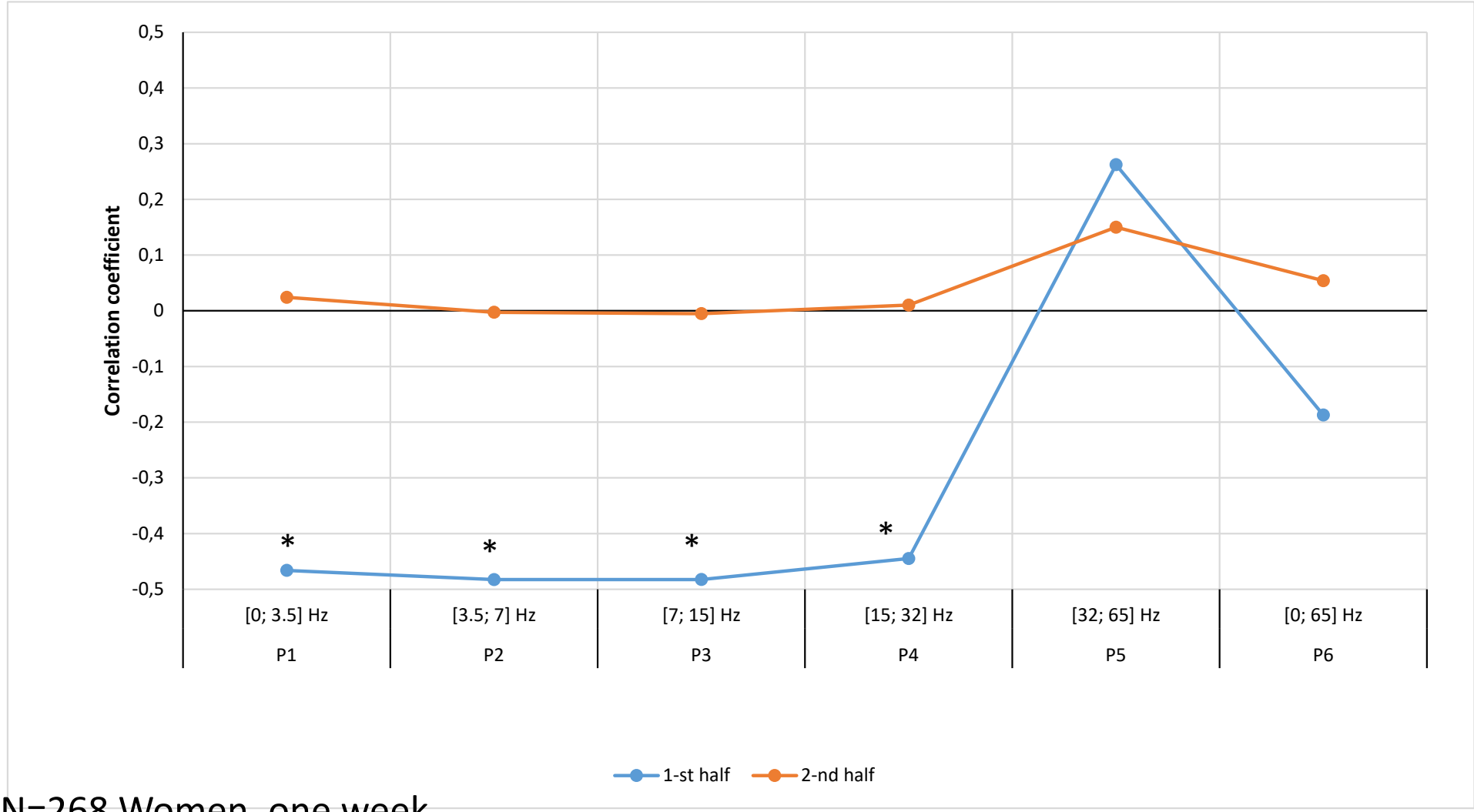
# Correlation Between Magnetic Field and AMI, Delay Effects




N=86 Males


Correaltion between MF strength 1, 2 and 3 days before admission and more than 2 AMI cases per day through the first half of the year
0,80
0,70
0,60
0,50
0,40
0,30
0,20
0,10
0,00
Correlation coeficient, r
[0;3,5]
[3,5;7]
[7;15]
[15;32]
[32;65]
[0;65]
Frequency inteval, Hz
on admission
1 day before
2 days before
3 days before

# Correlations Between Weekly Admissions of MI and Magnetic Field Power in Different Bands




N=268 Women, one week

Data from LUHS, Cardiology clinic, 2016, *p<0.05.

# Correlations Between Atrial Flutter & Fibrillation Episodes with Magnetic Field Data

| Corr | GCI[0-1Hz] | GCI[1-7Hz] | GCI[7-45Hz] | GCI[0,32-36Hz] | E-W |
|---|---|---|---|---|---|
| Sum | 0,214 | 0,321 | 0,424 | 0,385 | |
| N.Man | 0,254 | 0,423 | 0,503 | 0,477 | |
| N.Wom. | 0,057 | 0,049 | 0,112 | 0,085 | |
| Mean Age | -0,126 | 0,305 | -0,421 | -0,393 | |
| M. A.M. | 0,139 | -0,047 | -0,218 | -0,152 | |
| M. A.W. | -0,201 | -0,484 | -0,482 | -0,495 | |

N=94

# Correlations Between Different Frequencies and Trauma Frequencies

| **Traum<40** | **[0-1 Hz]GCI** | **[1-7 Hz]GCI** | **[7-45 Hz]GCI** |
|---|---|---|---|
| Sum | 0,277 | **0,563** | **0,440** |
| M.N. | **0,334** | **0,362** | 0,217 |
| W.N. | **0,525** | **0,608** | **0,534** |
| Mean,Age | 0,030 | -0,072 | -0,008 |
| M. Age | -0,055 | -0,016 | -0,049 |
| W. Age | 0,126 | -0,170 | -0,018 |
| Traum>40 | Corr [0-1 Hz] | [1-7 Hz] | [7-45 Hz] |
| Sum | -0,183 | -0,131 | -0,180 |
| M.N. | 0,154 | 0,066 | 0,020 |
| W.N. | -0,170 | **-0,338** | **-0,337** |
| Mean,Age | **-0,388** | **-0,482** | **-0,437** |
| M. Age | -0,131 | **-0,556** | **-0,517** |
| W. Age | **-0,552** | -0,193 | -0,208 |

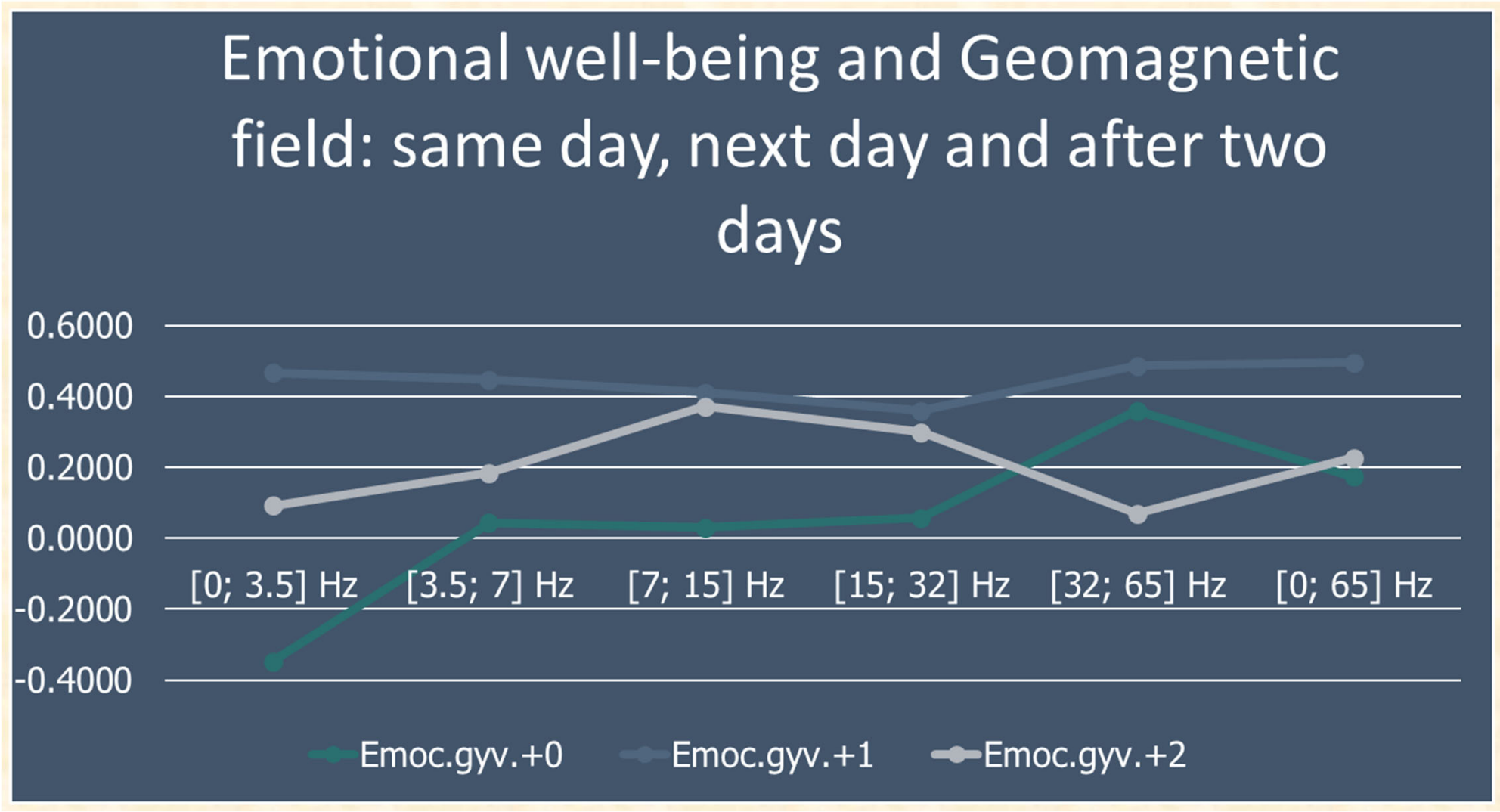
(N=182) < 40 years and > 40 years old: Kaunas population

# Correlations Between Magnetic Field and Students Physical, Emotional, Social and General feelings

| E-W | GCI[0-1Hz] | GCI[1-7Hz] | GCI[7-45Hz] |
|---|---|---|---|
| Ph.St.M | 0,046 | -0,060 | -0,100 |
| Ph.St.E | 0,238 | **0,390** | **0,355** |
| Ph.St.M+E | 0,237 | 0,188 | 0,151 |
| Em.St.M | **0,423** | **0,497** | **0,340** |
| Em.St.E | **0,307** | **0,512** | **0,598** |
| Em.St.M+E | **0,432** | **0,529** | **0,520** |
| Soc.M | **0,327** | 0,087 | -0,037 |
| Soc.E | 0,187 | **0,367** | **0,359** |
| Soc.M+E | **0,426** | **0,304** | 0,250 |
| G.St.M | **0,314** | 0,285 | 0,057 |
| G.St.E | 0,000 | -0,142 | **0,598** |
| G.St.M+E | 0,192 | 0,272 | 0,224 |

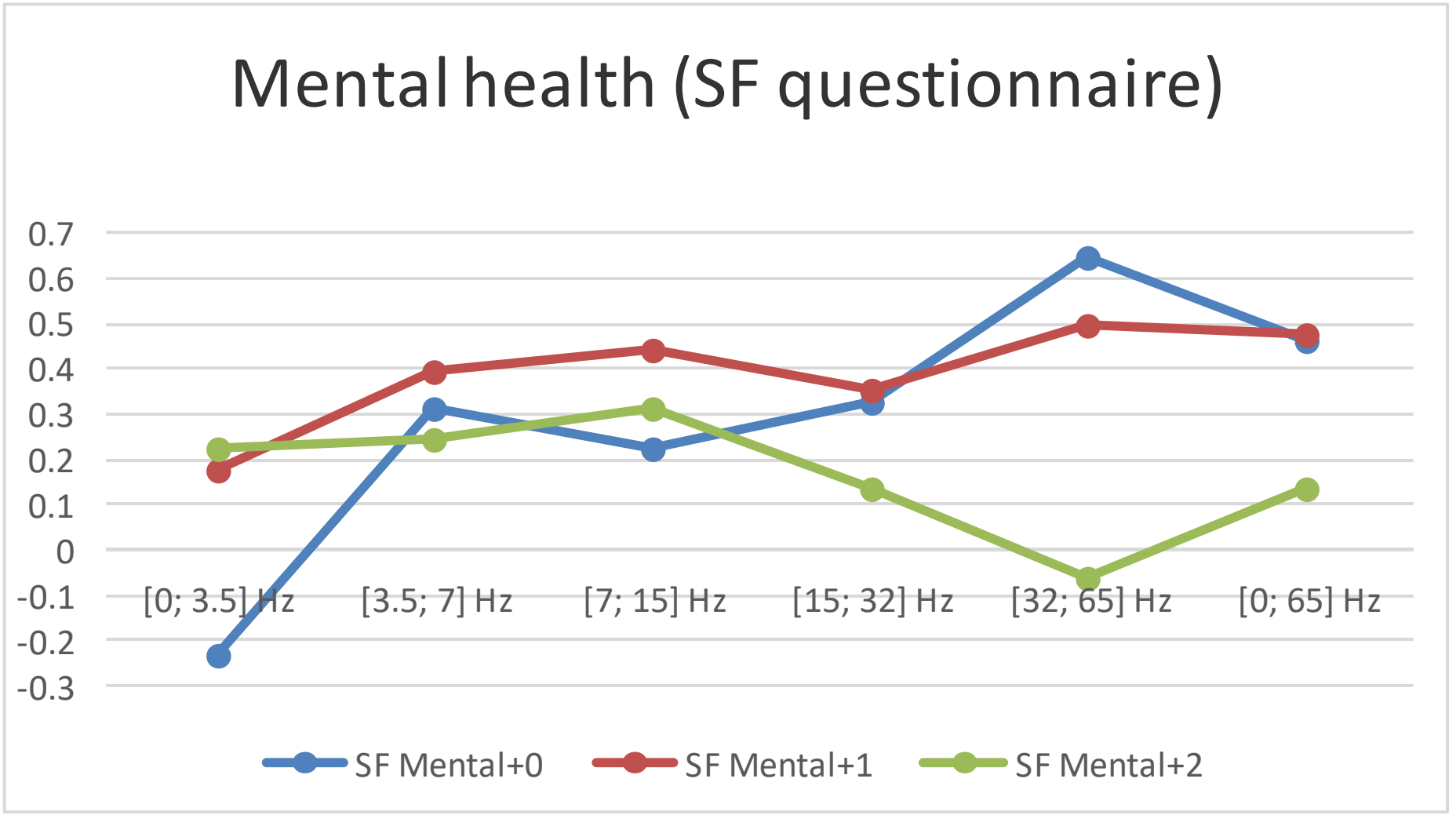
(N=20)

# Correlations Between Emotional State and Schumann Resonances in Different Frequency Bands



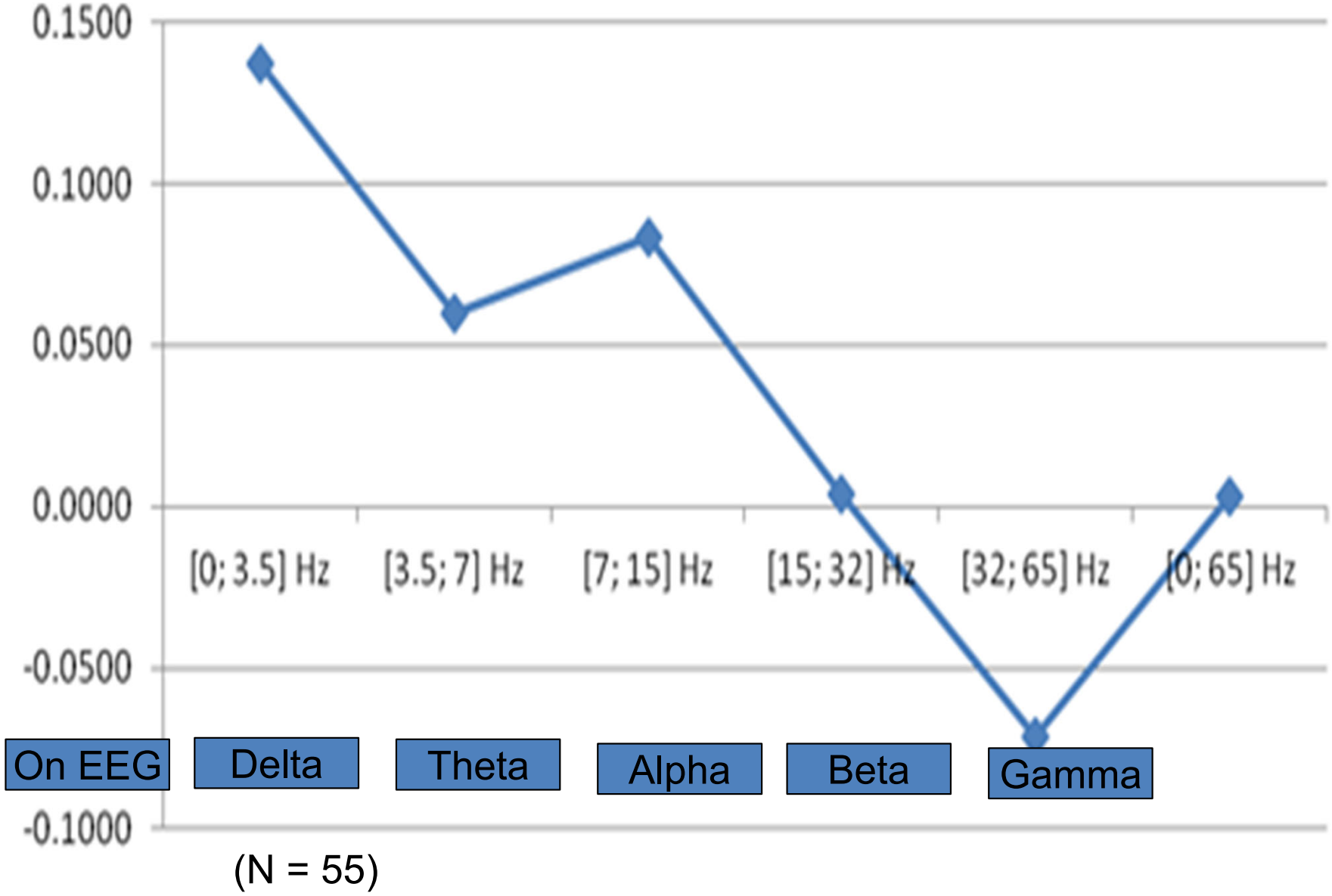

(N = 55), delay effect

# Correlation Between Mental State and Schumann Resonances in Different Frequency Bands



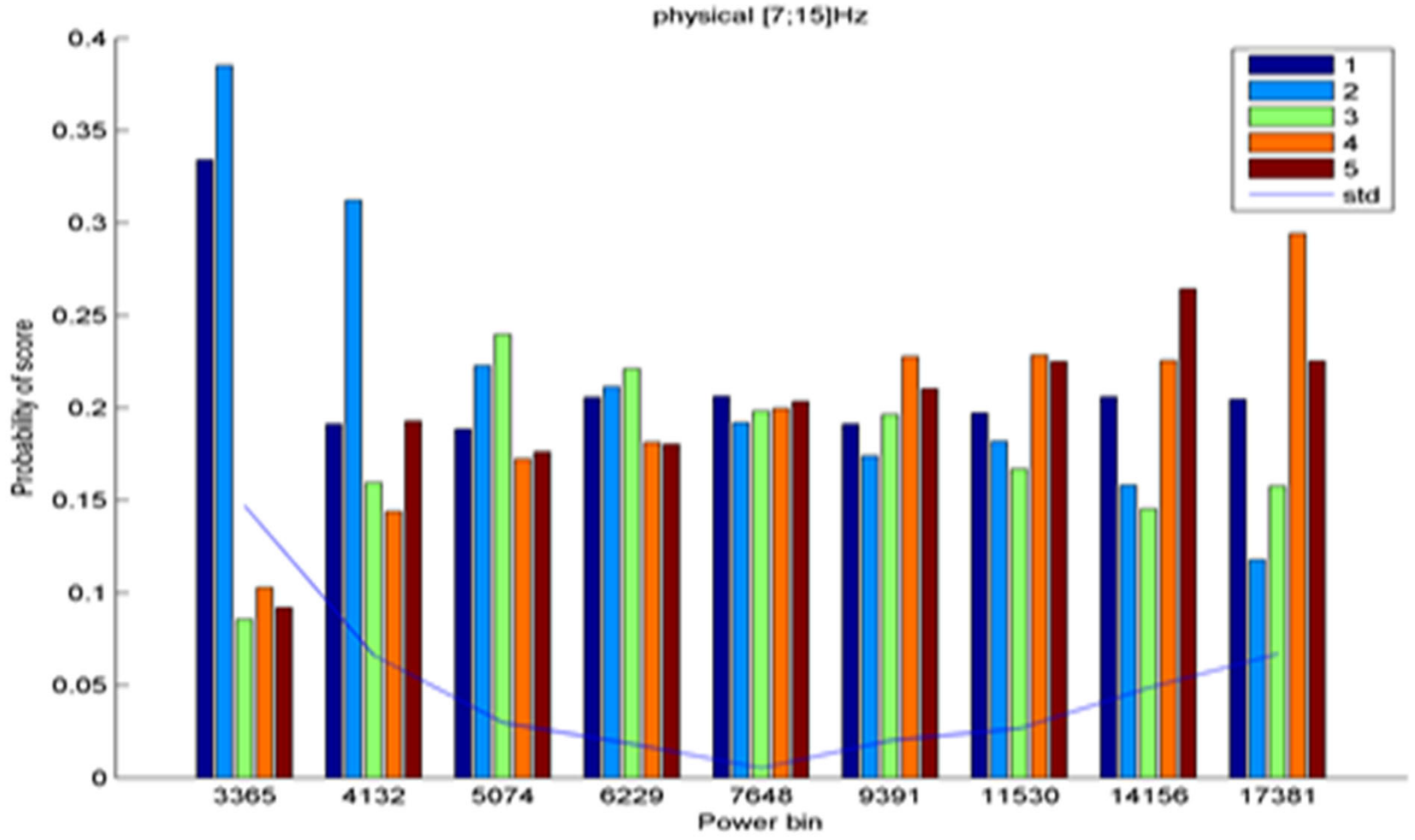

(N = 55), delay effect.

# Correlations Between Physical State and Schumann Resonances in Different Frequency Bands



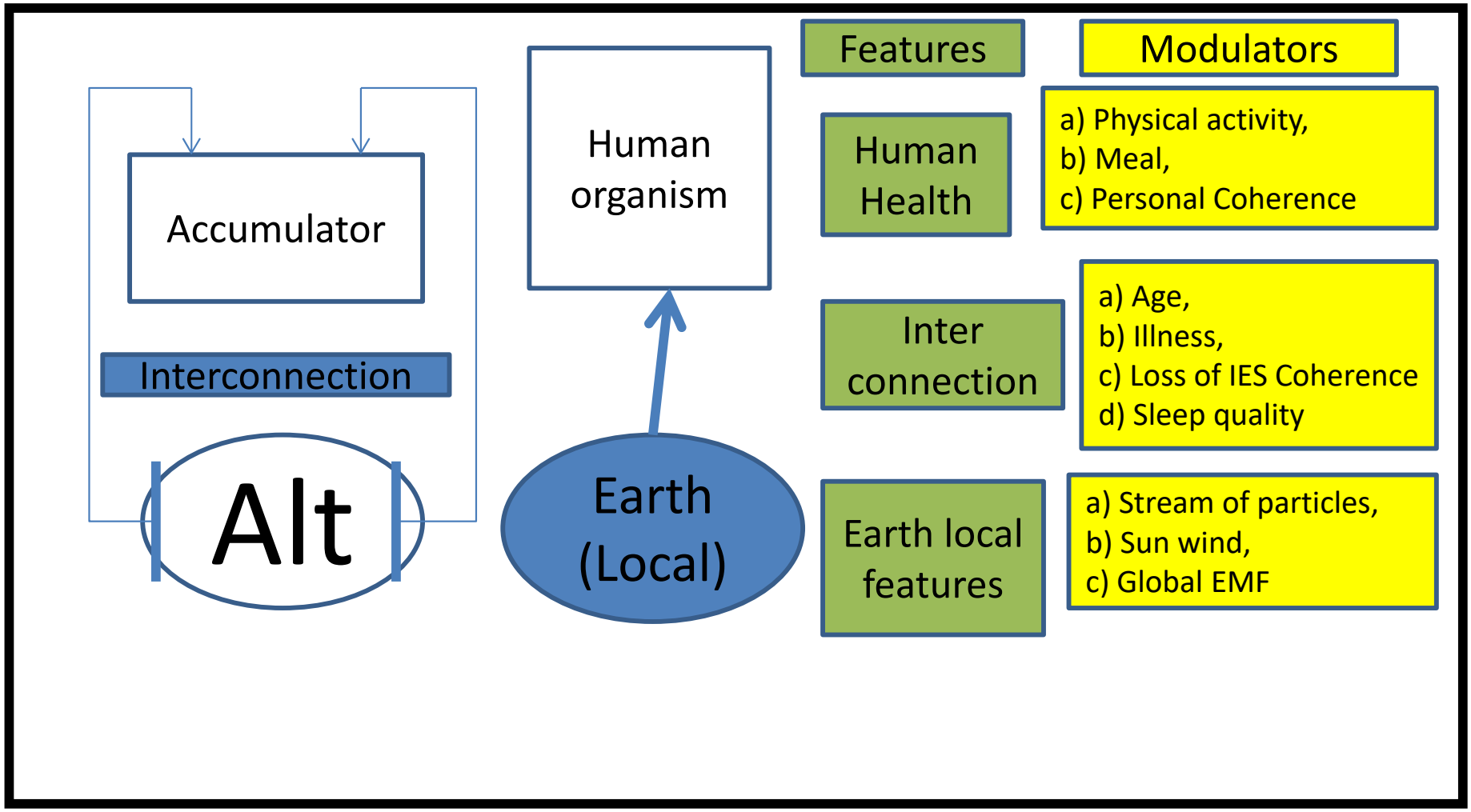

(N = 55)

# Distribution of Participants' Physical wellness Scores with Respect to Magnetic Field Power in Frequency Band Between 7–15 Hz (Alpha rhytm)




N=55 (1 – bad, 5 – excellent)

# Human–Earth Interactions



# Conclusions

- Moderate to strong correlations between blood parameters and changes in the local Earth magnetic field.
- Derivate values of blood parameters correlate stronger than routine blood parameters.
- Correlations of blood parameters and Earth MF differ in genders.
- Men, who suffer from MI have higher sensitivity to changes in Earth's Magnetic Fields.
- During the summer when there are increases in low frequency MF fluctuations, the number of MI admissions decreases.
- During spring and autumn, there are higher fluctuations in the MF,  there are higher number of MI admissions.

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Now that is possible!

Thank You for attention!