



Stockholm University

# Stress Research Institute

## The effects of a 6 hours on/ 6 hours off maritime watch system on sleep and sleepiness using bridge and engine room simulators

Wessel van Leeuwen<sup>1</sup>, Claire Pekcan<sup>2</sup>, Margareta Lützhöft<sup>3</sup>, Mike Barnett<sup>2</sup>, David Gatfield<sup>2</sup>, Göran Kecklund<sup>1</sup>, Torbjörn Åkerstedt<sup>1</sup>  
(1) Stockholm University, Stockholm, Sweden, (2) Warsash Maritime Academy, Warsash, United Kingdom (3) Chalmers University of Technology, Gothenburg, Sweden

### Introduction

- Fatigue at sea is a safety issue that has hardly been studied before
- This study investigates sleep and sleepiness in a simulated 6 on /6 off watch system during 1 week
- Both bridge and engine room simulators are used during a 1 week simulated voyage through the North Sea and English Channel.

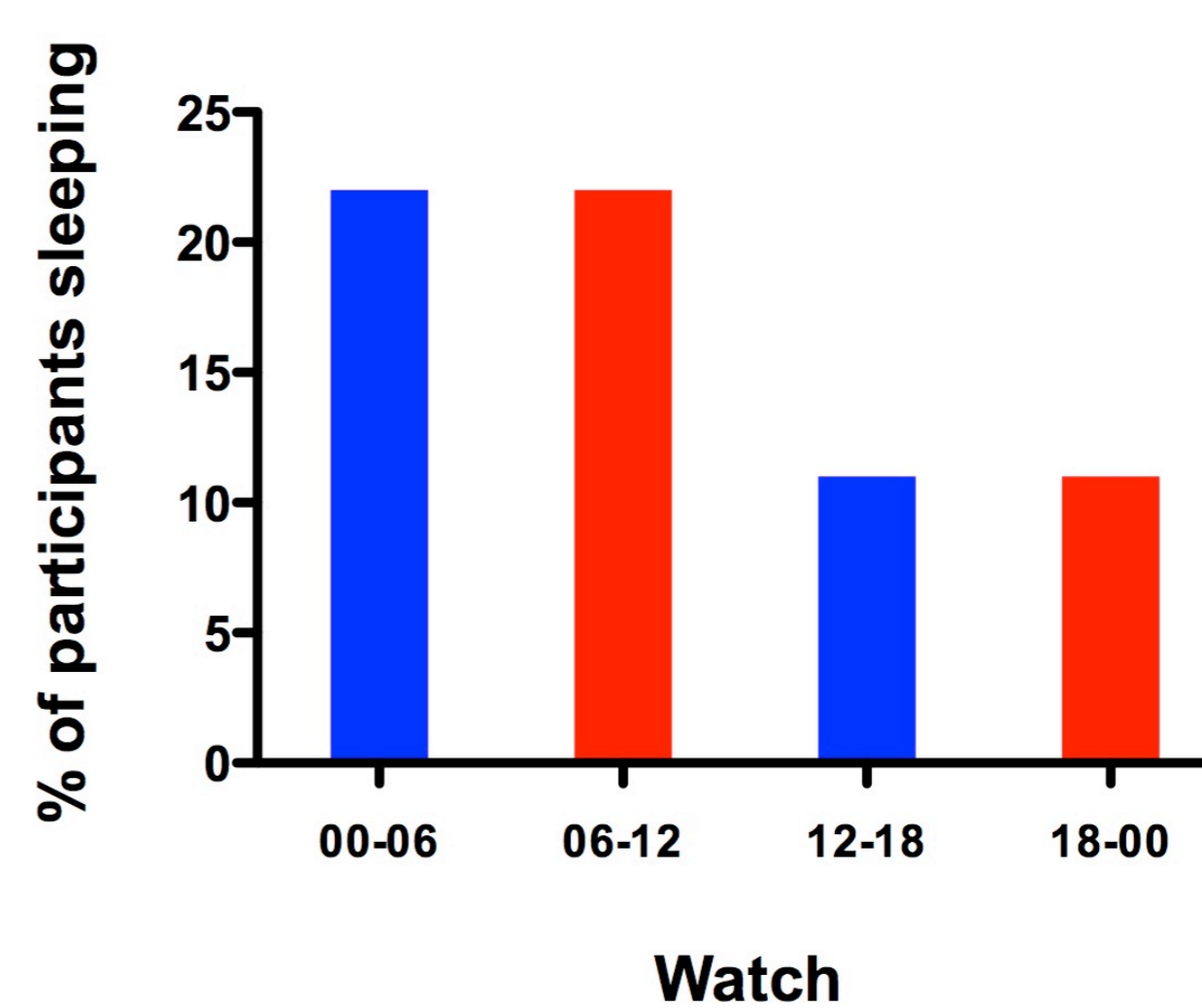
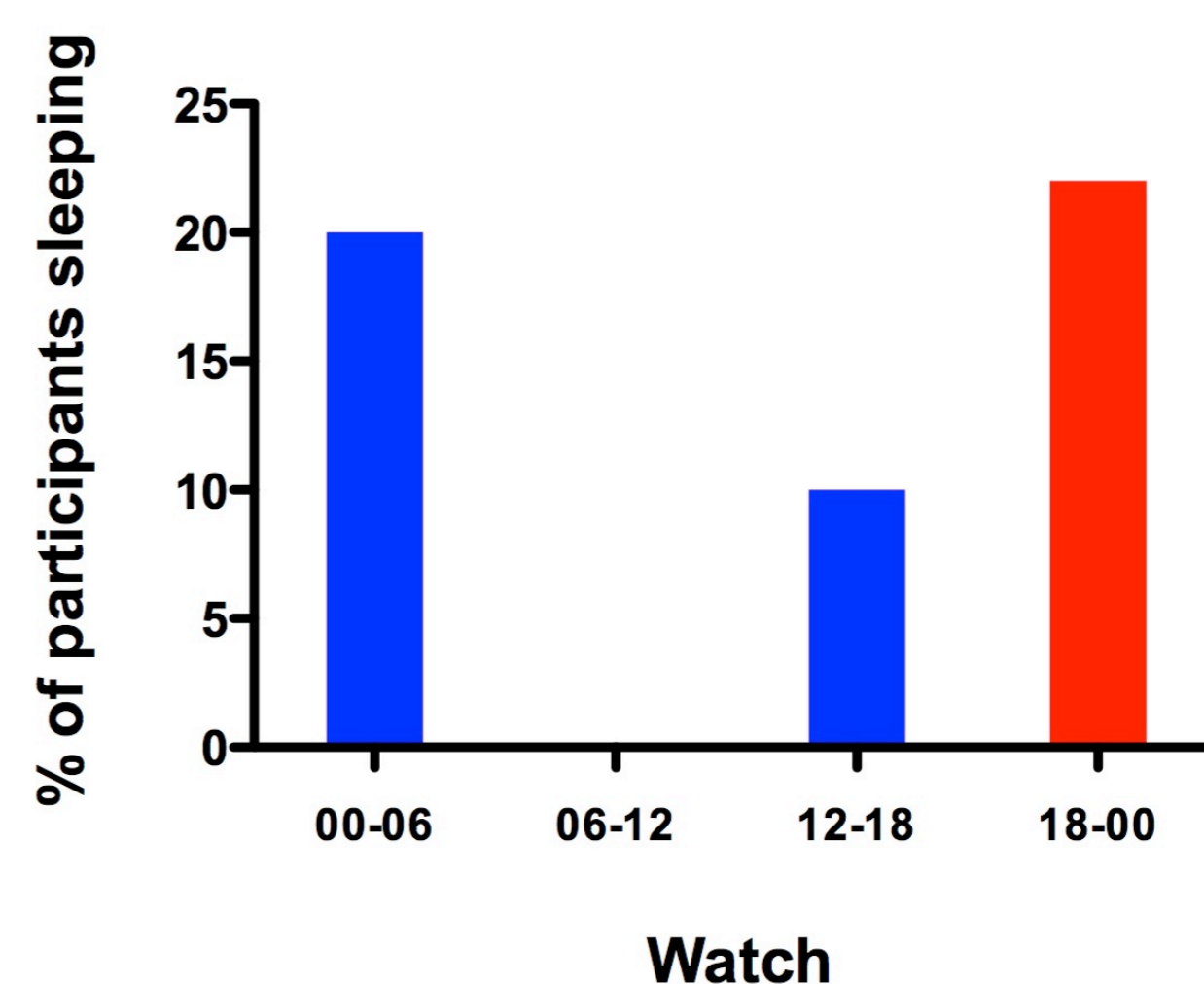
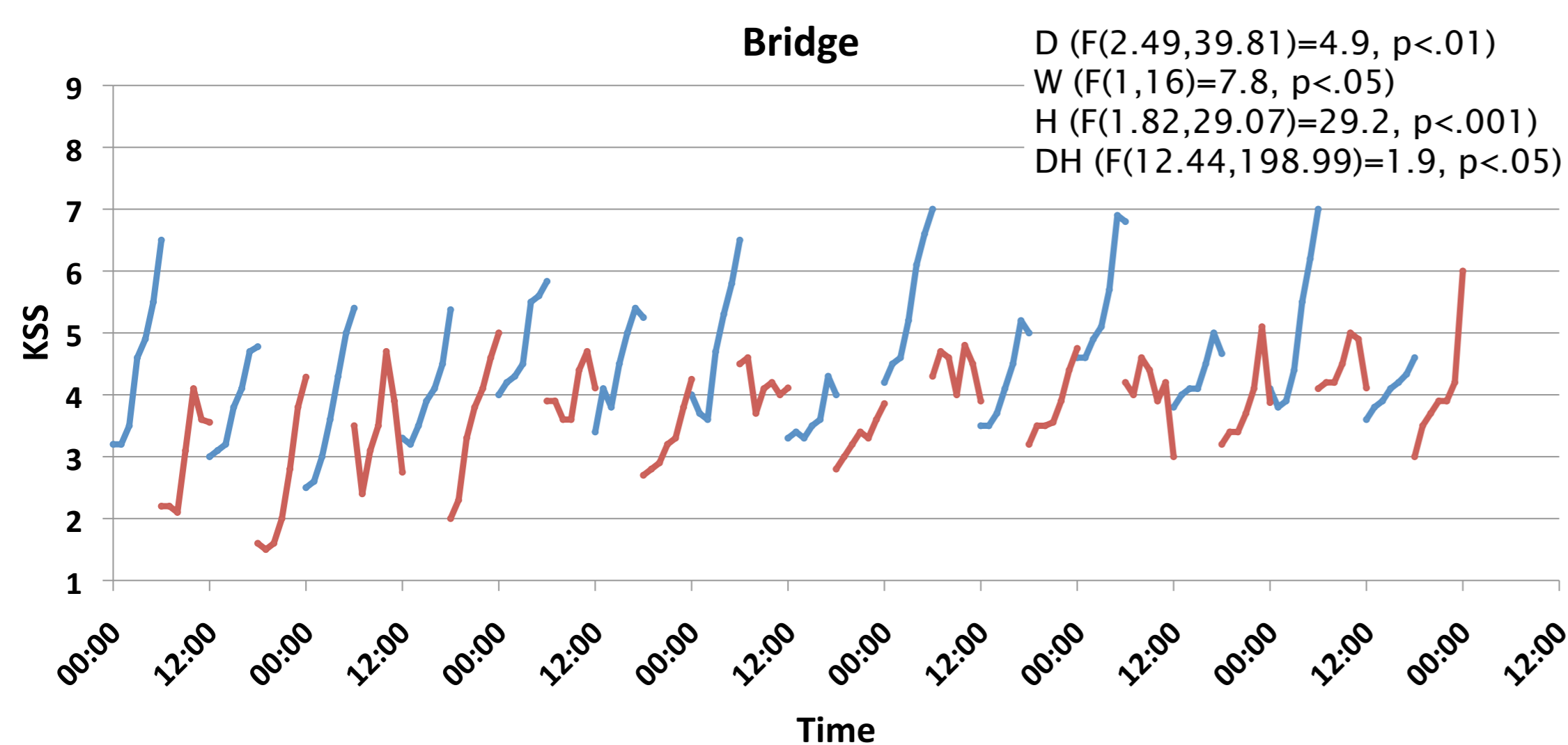
### Conclusion

- Sleepiness peaks during the end of night watches and increases during the course of the week
- Sleep on watch is most prevalent during evening, night, and morning
- Daily sleep duration is slightly lower in the team working 06:00 to 12:00
- Similar observations for bridge and engine room

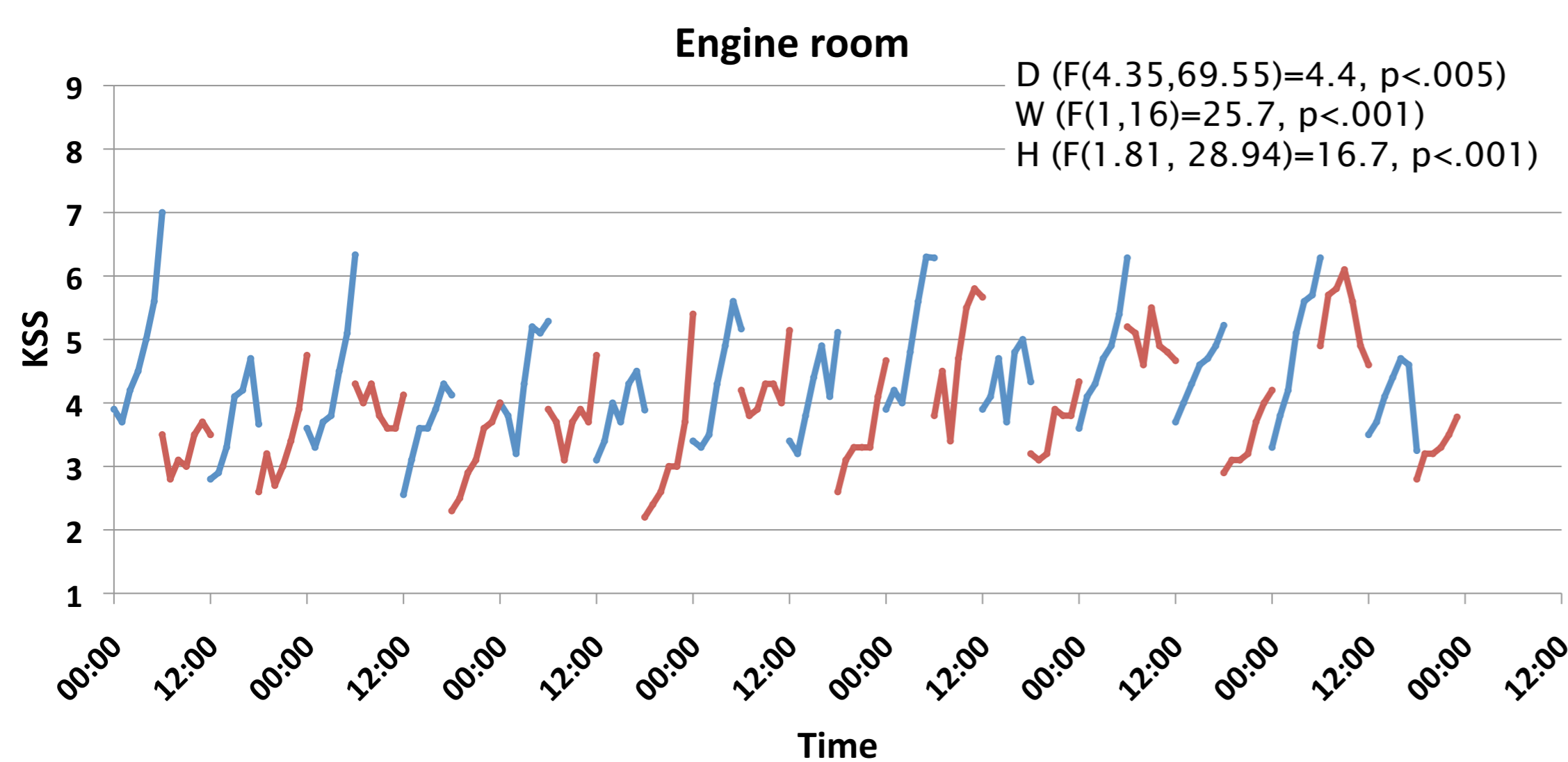
### Results

Sleepiness peaks night and morning watches...

...which are also the watches with most sleep on duty.



Team 1: 00-06 & 12-18  
Team 2: 06-12 & 18-00

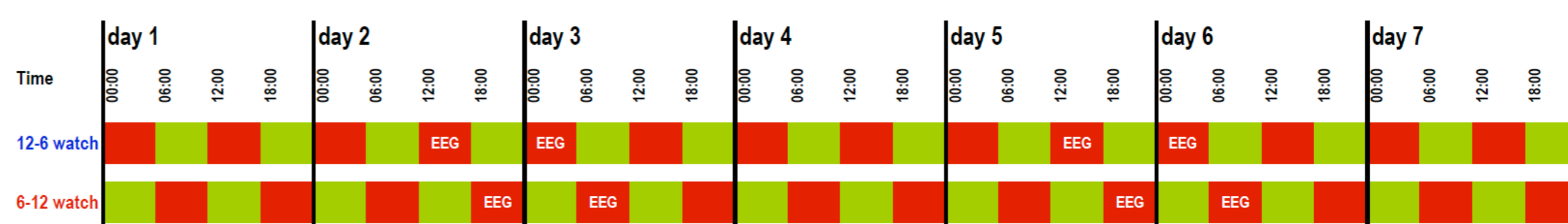
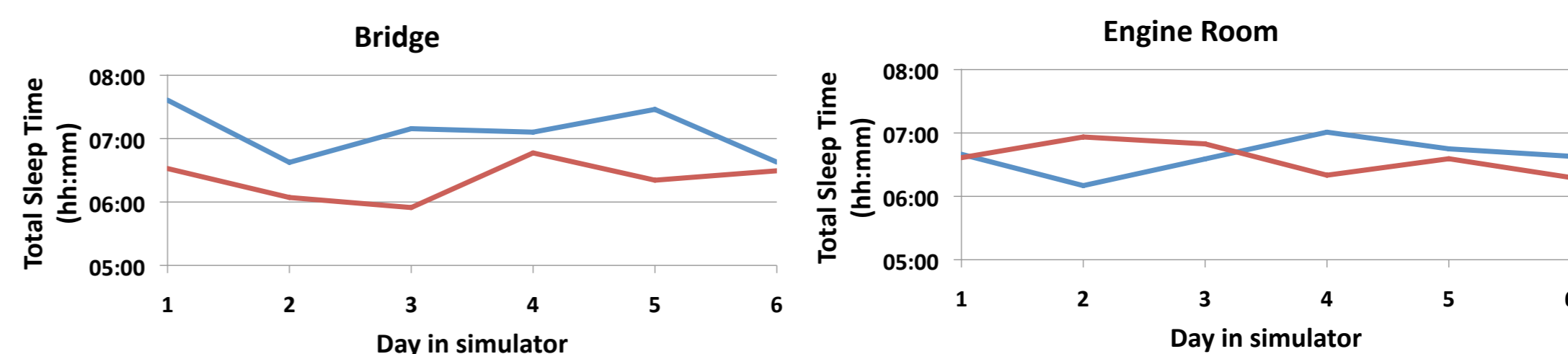


### Methods

20 male bridge officers (aged 31 ± 9 years) and 20 engineers (aged 32 ± 8 years) participated in paired bridged and engine room simulators. The two watch teams started with a full training day in the simulators and then, from day 1 on, started an identical voyage in the North Sea and the English Channel. Participants rated their sleepiness every hour (Karolinska Sleepiness Scale, KSS) and carried out a 5-minute psychomotor vigilance test (PVT) at the start and the end of every watch. In addition, EEG was recorded during four watches (see Figure).

Repeated measures ANOVAs were used with day (D), watch (W), and hours in watch (H) as within subject factors and watch team (T) as between subject factor. Only significant effects (p<.05) are indicated with their F values.

Total daily sleep duration is slightly lower in the team working 06:00 to 12:00



### CONTACT