

Abstract

The analysis of sleep based on examinations outside of sleep laboratories is becoming increasingly important. For example, in Ambient Assisted Living there is a need for behavioral monitoring and sleep laboratories are expensive, complex and have a number of disruptive factors due to the measurement technology used. This master's thesis deals with the recording of frequency time series of respiration, heartbeat and movement during sleep using ballistocardiography and the sleep analysis based on these time series. For this purpose, a pneumatic sensor system for recording data and a method to derive sleep phases from the time series were developed. The sensor system was evaluated in comparison with the Withings Sleep Analyzer and examined in a study with 11 overnight measurement series.