



Wilhelmina Children's Hospital

Research in fetal monitoring in labour

University Medical Centre Utrecht

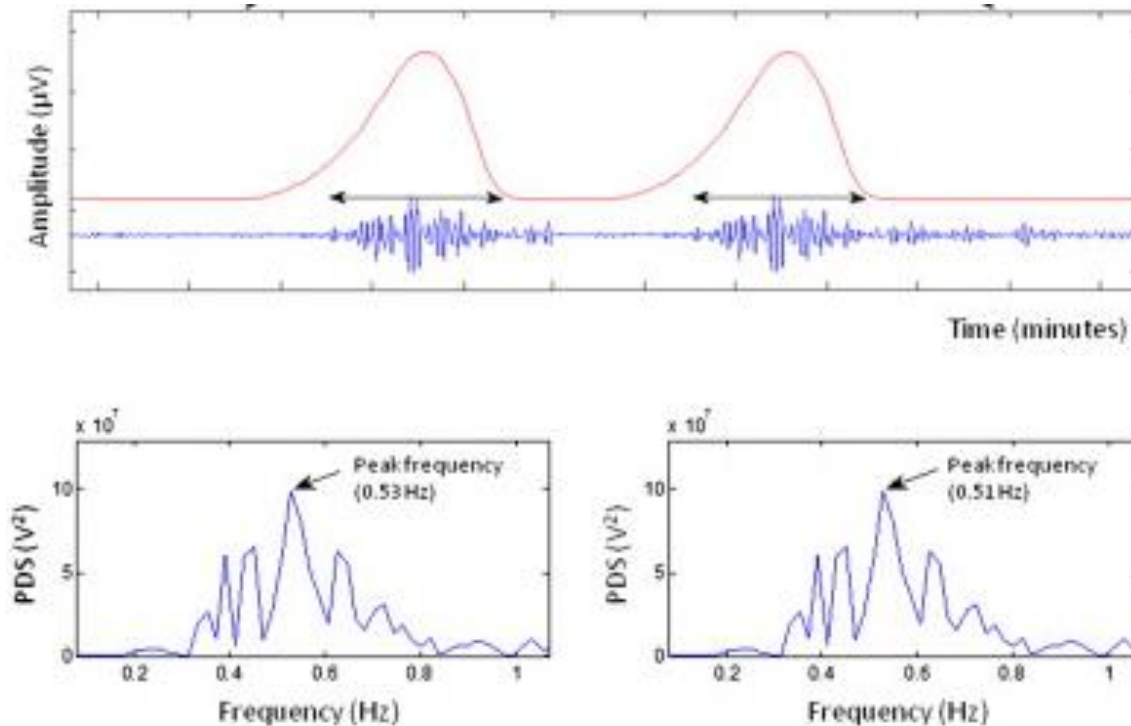
Hannah van Scheepen



MAPLE



- Monitoring Uterine Activity and Progress of Labour
 - Validation of Electromyography for contraction registration
 - Spectral analysis – PSD peak frequency



MAPLE



– Key players

- Margo Graatsma MD PhD; resident in obstetrics
- G. Visser; professor of obstetrics
- Edu Mulder; associate professor in reproductive medicine
- Benoit Jacod MD PhD; resident in obstetrics
- Blanka Vasak; PhD student, resident in obstetrics

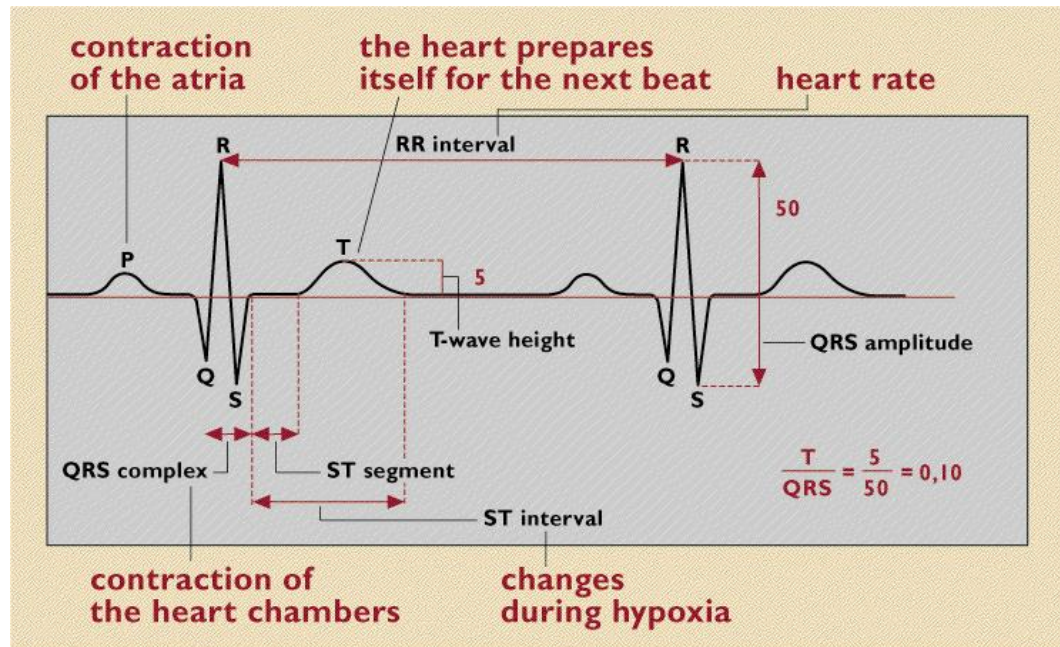
– Publications

- Jacod et al. Maternal-Fetal and Neonatal Medicine 2010
- Vasak et al. Obstet Gynecol 2013





- ST-analysis
 - Change in T/QRS ratio compared to baseline T/QRS ratio
 - No added value in the prediction of adverse neonatal outcome or interventions for suspected fetal distress.
- Cost-effectiveness



STAN

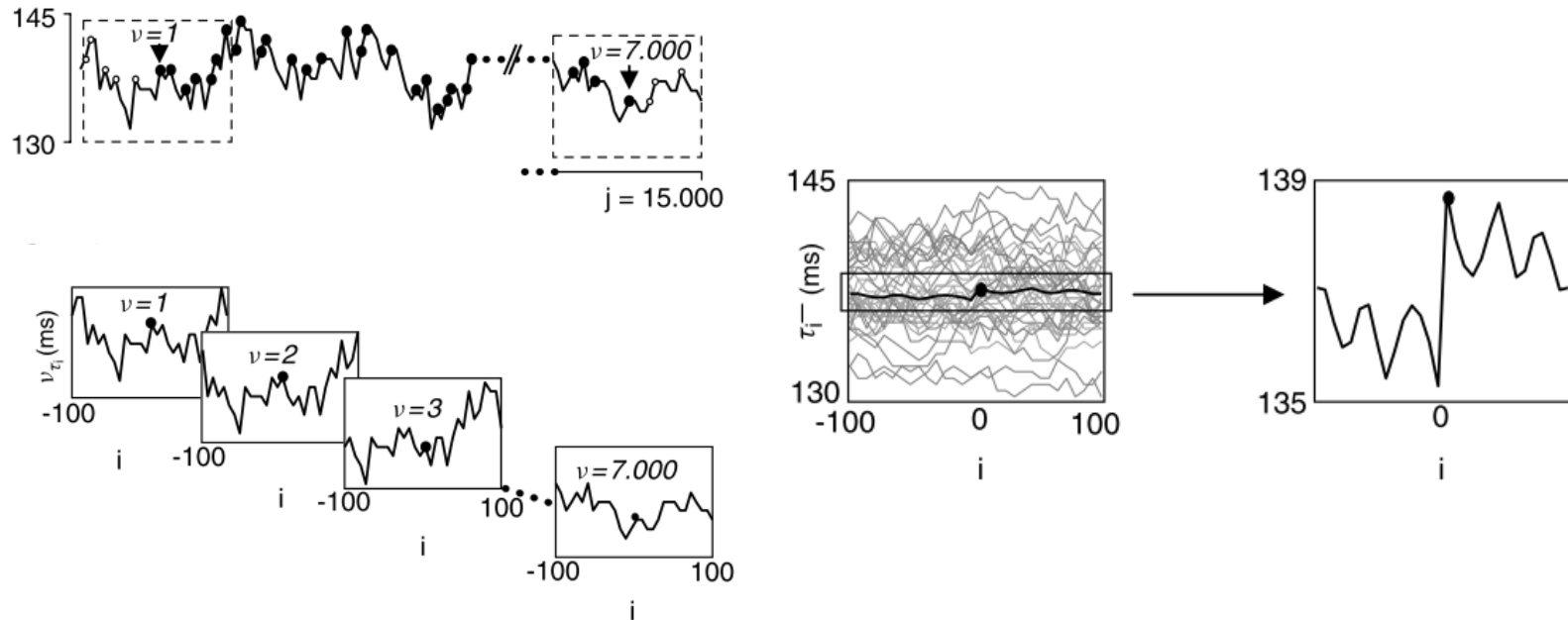


- Key players
 - Anneke Kwee; Gynaecologist
 - Michelle Westerhuis MD PhD; resident in obstetrics
- Key publications
 - Vijgen et al. Obstet Gynecol 2011
 - Westerhuis et al. Obstet Gynecol 2012
 - Becker et al. Obstet Gynecol 2012



Phase Rectified Signal Averaging

- PRSA analysis both in labour as during pregnancy



Goal: Improving patient care

- Better tools to monitor intra-uterine fetal condition to improve perinatal outcome
- Bringing research to patient care
- Introducing objective measures such as PRSA to CTG interpretation in clinical practice



Preliminary Results – PRSA pre-term

- Identification IUGR
 - Graatsma et al. Maternal-Fetal and Neonatal Medicine 2012 ; UMC Utrecht

Average acceleration and deceleration capacity of fetal heart rate in normal pregnancy and in pregnancies complicated by fetal growth restriction

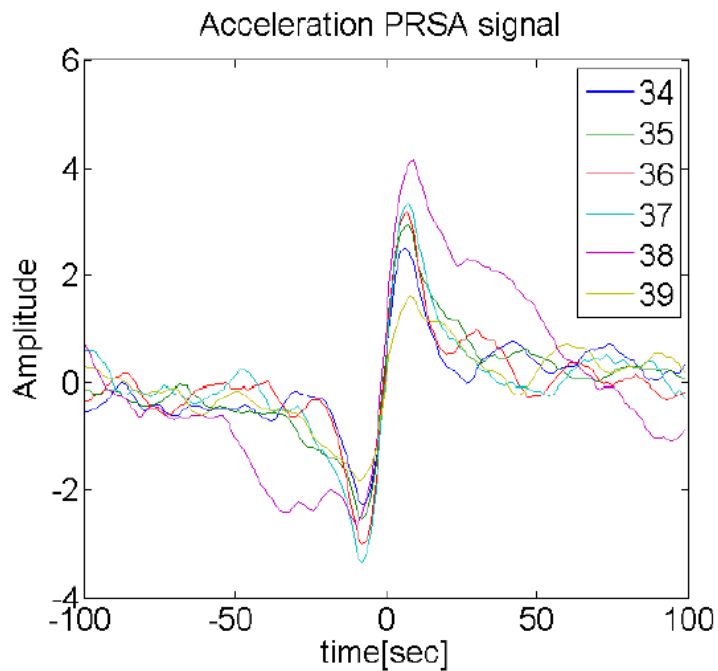
E. M. Graatsma¹, E. J. H. Mulder¹, B. Vasak¹, S. M. Lobmaier², S. Pildner von Steinburg², K. T. M. Schneider², G. Schmidt³ & G. H. A. Visser¹

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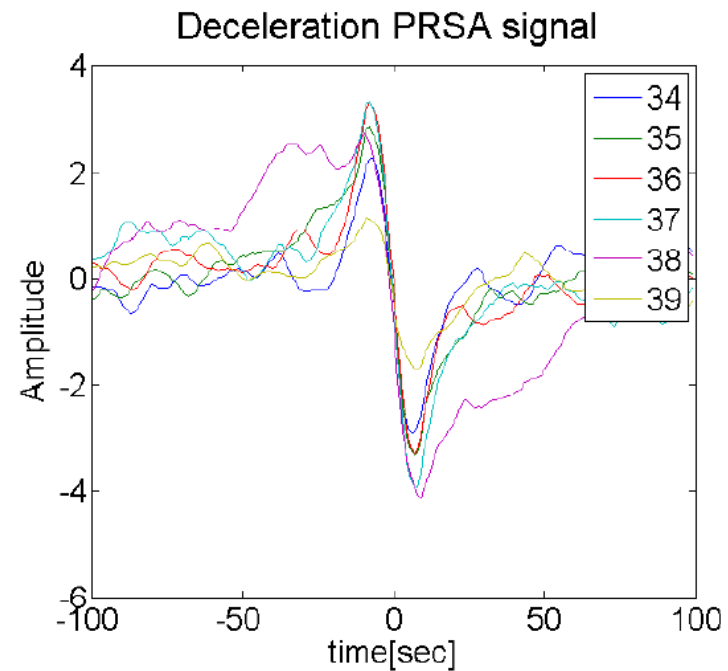


Preliminary Results – PRSA pre-term

- Influence of gestational age
 - Influence – larger population



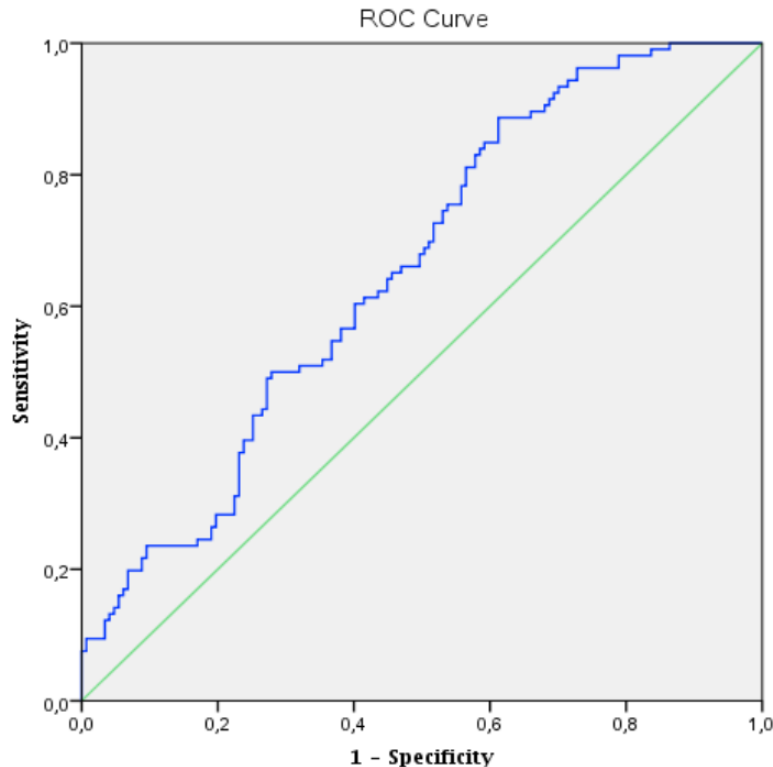
(a) Acceleration PRSA



(b) Deceleration PRSA

Preliminary Results – PRSA pre-term

- At home monitoring – sense4baby



ROC curve of the logistic regression model with parameters AAC, ADC, APRS and DPRS.

Future Challenges

- Next steps
 - Larger population
 - Determine the predictive values
- Implementation in daily practice
- Possible improvements of PRSA
- Labour



Phase Rectified Signal Averaging

- Key players
 - Arie Franx; professor in obstetrics and head of department
 - Wendy Koster; assistant professor in reproductive medicine
 - Blanka Vasak; PhD student, resident in obstetrics
 - Hannah van Scheepen; Technical Medicine student at University of Twente
 - Antoniya Georgieva; scientific director of the Oxford centre for Fetal Monitoring Technologies
 - Christopher Redman; emeritus professor of Obstetric Medicine



Questions or suggestions?

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