

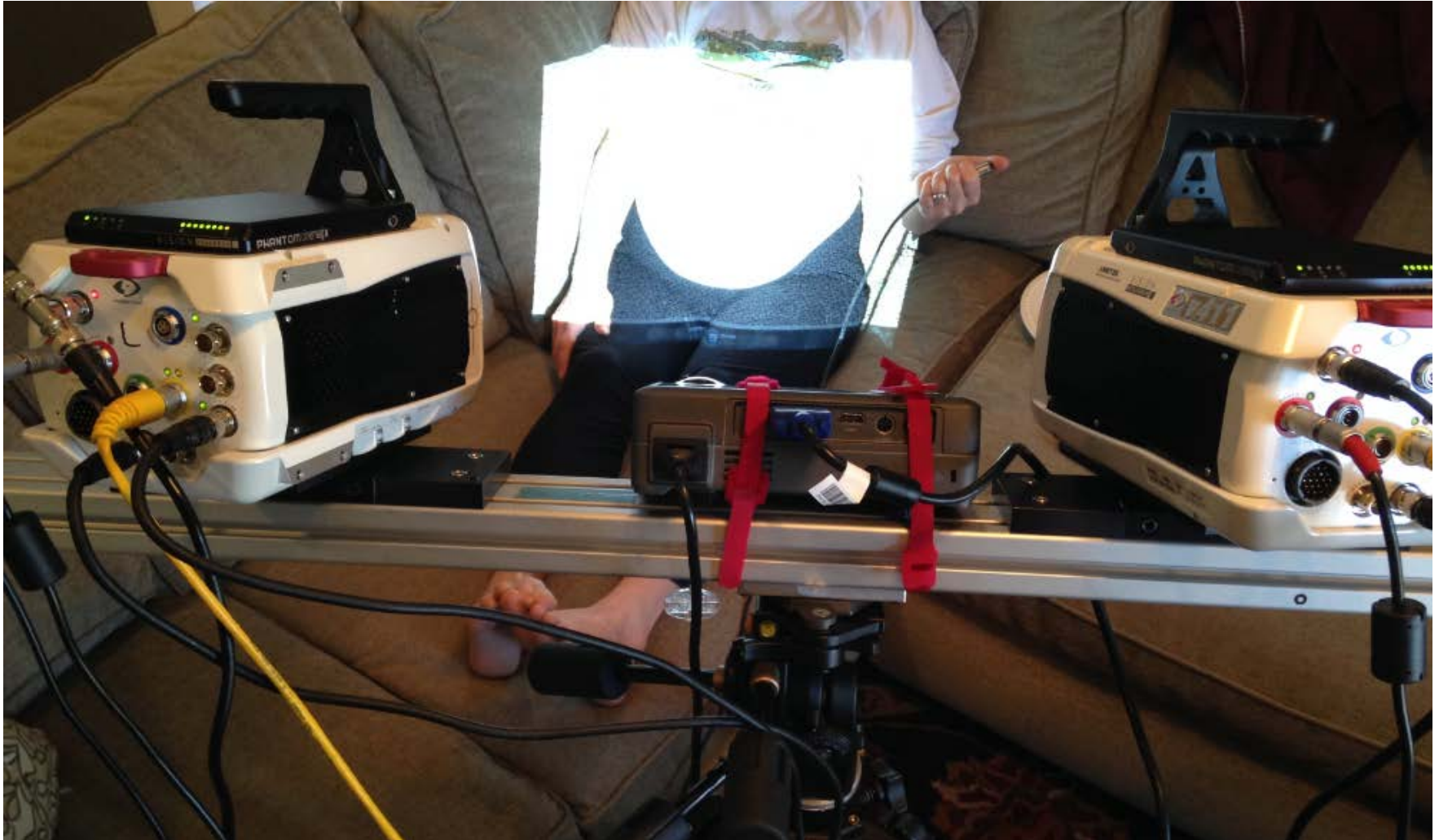
Application of Optical Measurement Techniques during Stages of Pregnancy

Use of Phantom High Speed Cameras for Digital Image Correlation (D.I.C.) during baby kicking and abdomen movements

Paul Gradl / NASA MSFC

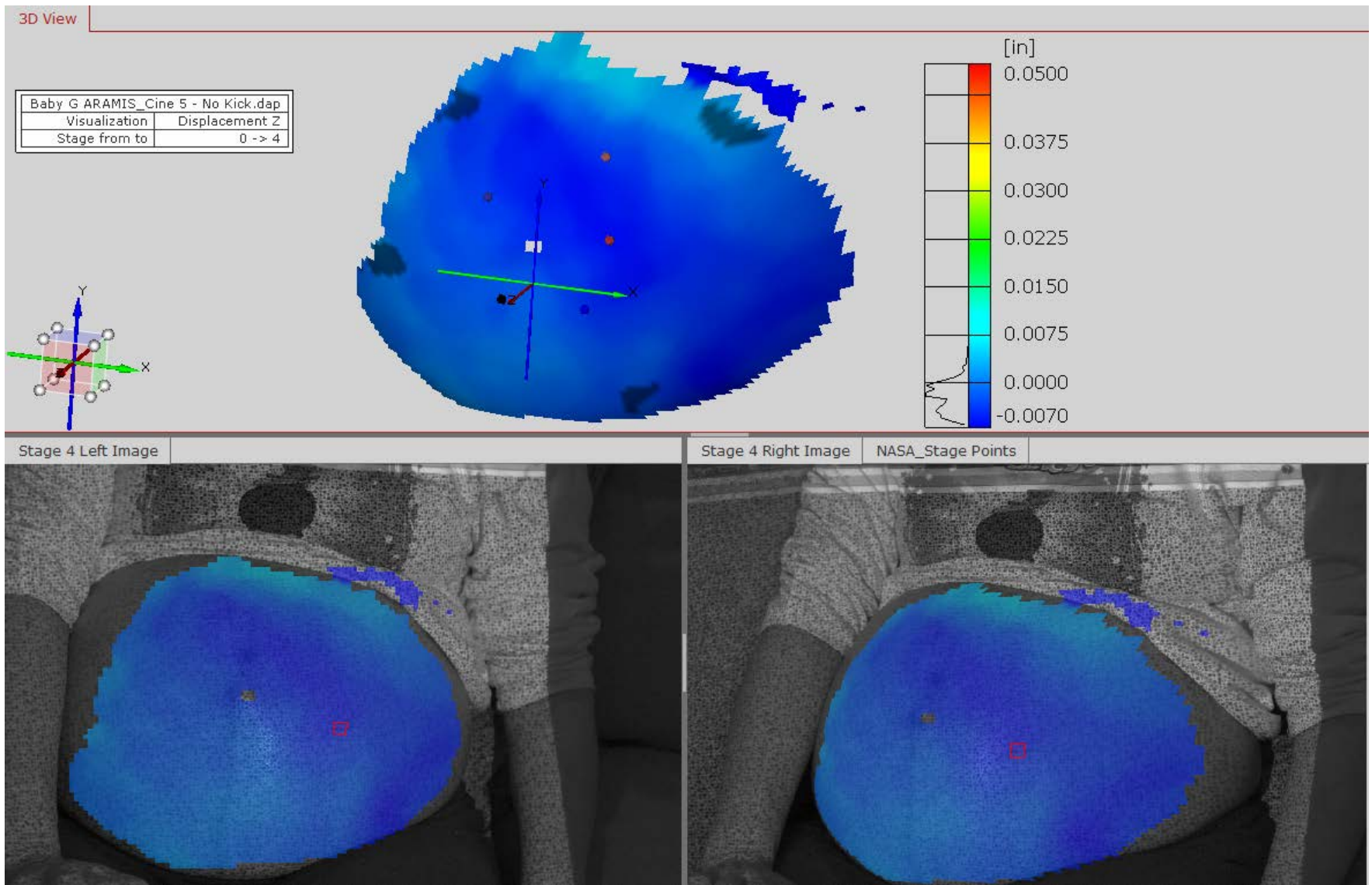
Paired images were collected using a projected pattern instead of standard painting of the speckle pattern on her abdomen.

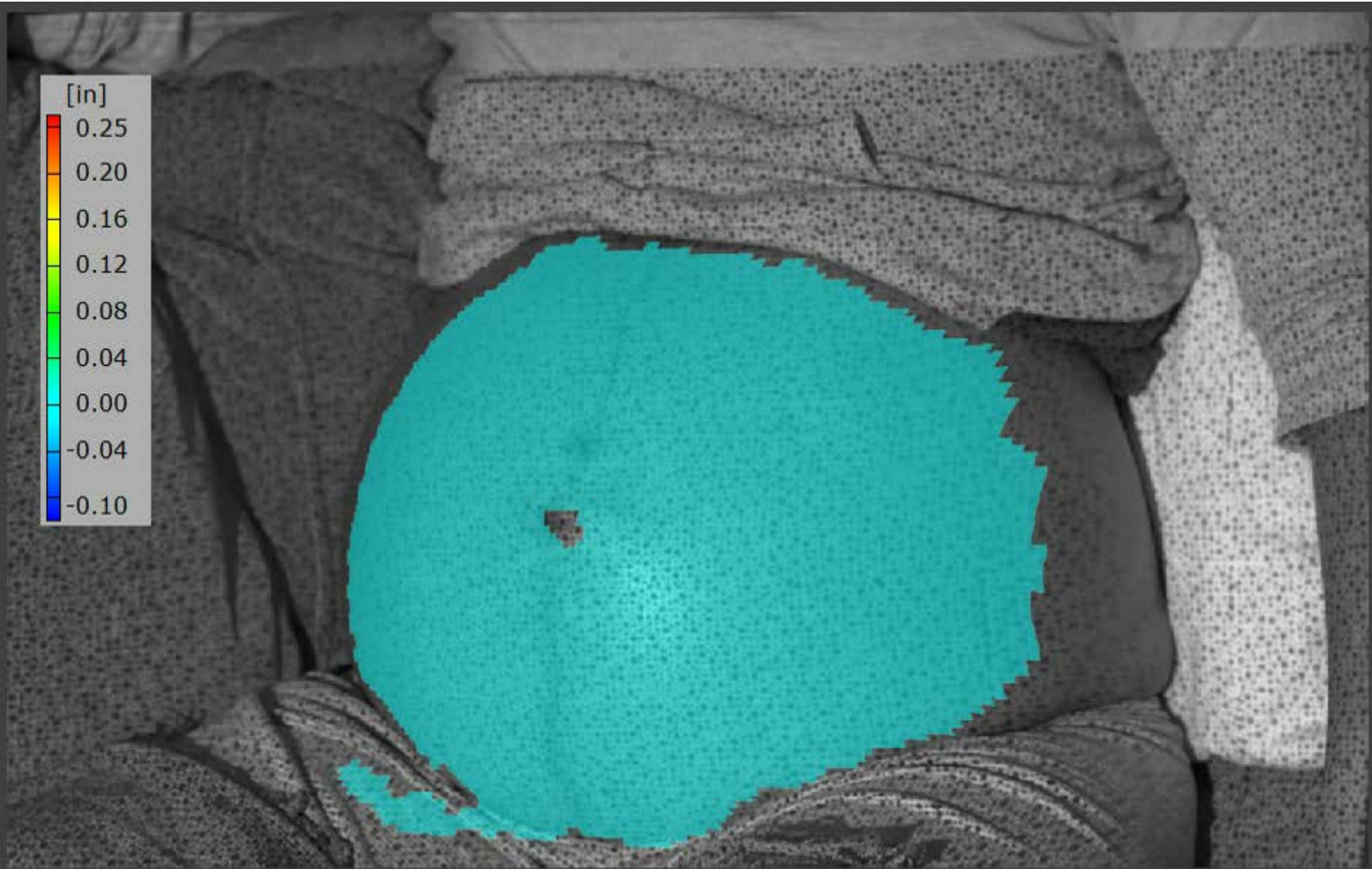
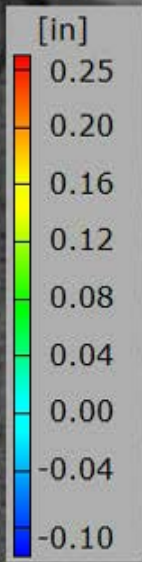
High Speed cameras were post triggered after movements felt.



Data was collected at 120 fps – limited due to 60hz frequency of projector

To ensure that kicks and movement data was real a background test was conducted with no baby movement (to correct for breathing and body motion)

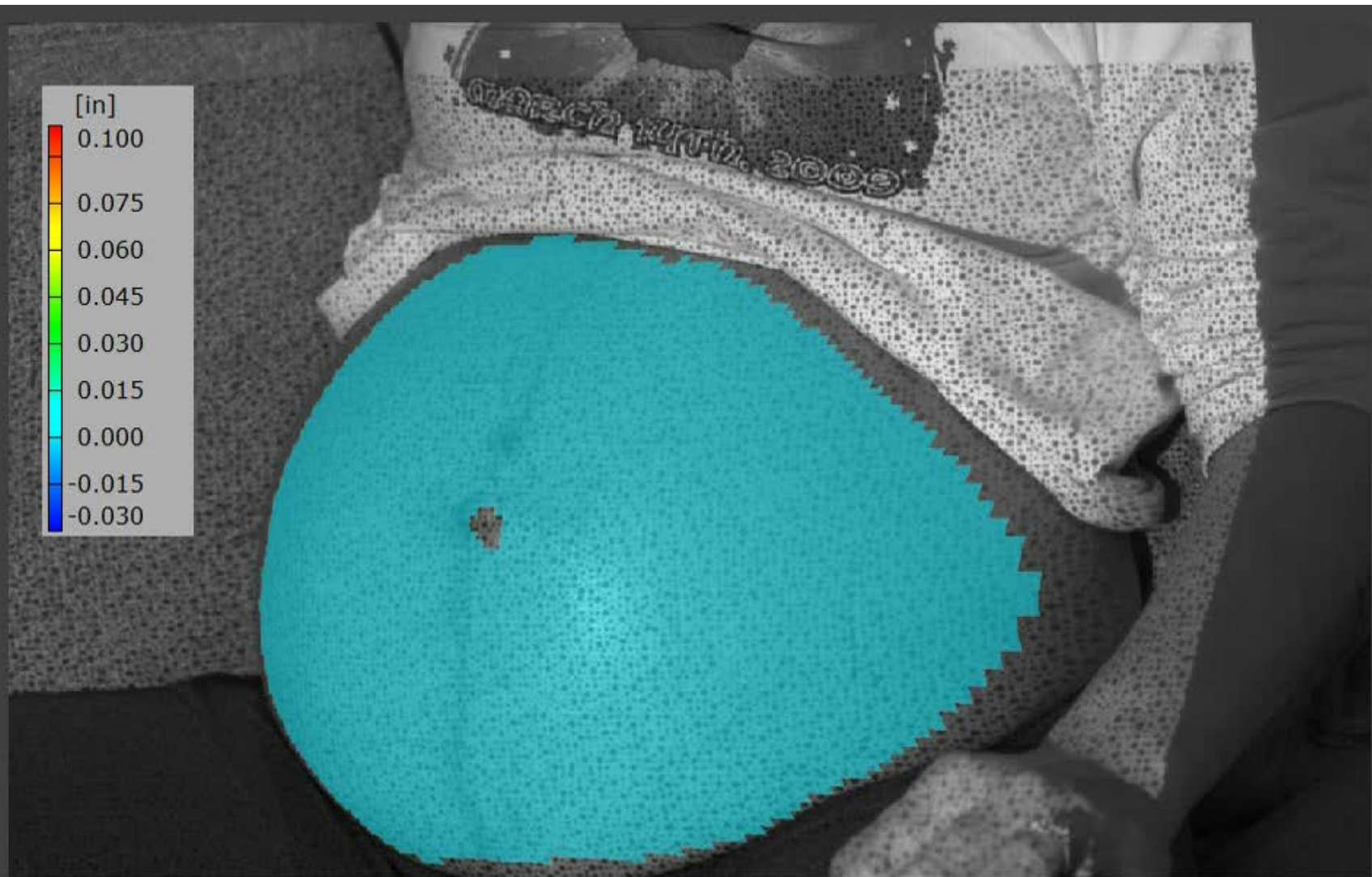




Time 0.00 seconds

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Displacement in Z Axis
Baby Gradl Movement - Shift to Right Side



 [Click to Play Video](#)

Time 0.00 seconds

**Displacement in Z Axis
Baby Gradl Movement - Baby Kicking**

References

Gradl, P.R. **“Application of Optical Measurement Techniques during Stages of Pregnancy”**. Technical Paper, Unpublished. (2016).