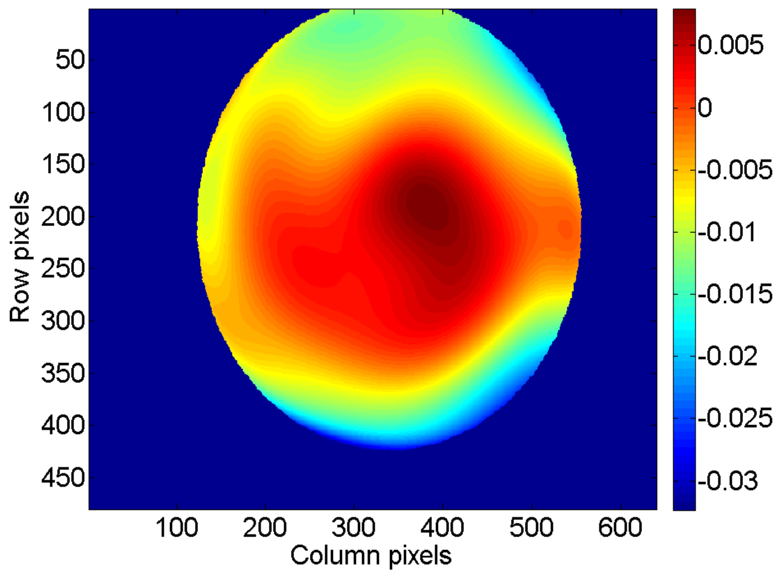

Fig. 10. Result obtained by the Mach-Zenhder interferometer using the proposed method for the λ/100 high quality glass plate

Table 5. , rms (root mean square) and pv (peak to valley) of the wave-front error measured by the Zygo interferometer and with the Mach-Zenhder interferometer for the λ/100 high quality glass plate

	rms (waves)	*pv (waves)*
Zygo	0.010	0.068
Mach-Zenhder	0.0091	0.042

As can be seen from Table 5, the results obtained with both instruments are very similar. The difference in the *rms* measurement is of about 0.0009 waves. On the other hand, the difference in the *pv* measurement is 0.026 waves.

5. Conclusions

We have proposed an interferometric method that is capable to obtain accurate measures when severe vibrations are present, that it is the case when it is desired to perform an object interferometric characterization inside a thermal-vacuum chamber, for example. The method doesn't need any phase-shifter device and it takes advantage of these vibrations to produce the different phase-steps that are used to demodulate the phase. The proposed method is based on spatial and time domain processing techniques to compute first the different unknown phase-shifts and then reconstruct the phase from these tilt-shifted interferograms. In order to compensate the camera movement, it is needed to perform an affine registration process between the different interferograms. Simulated results and experiments demonstrate the effectiveness of the proposed method. This method can be used in a very hostile environment as thermo-vacuum chambers to obtain accurate interferometric tests. On the other hand costly phase-shifting devices are not longer required for steady-state measures.

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