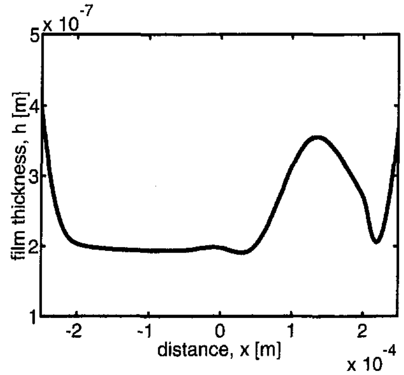

Fig. 4 Film thickness profile; $t = 7.5 \cdot 10^{-4}$ s

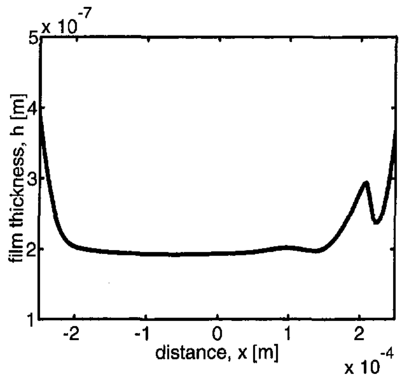

Fig. 5 Film thickness profile; $t = 1.0 \cdot 10^{-3}$ s

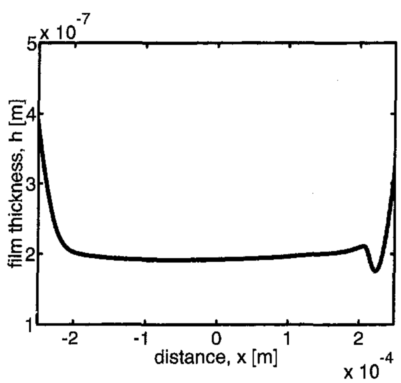

Fig. 6 Film thickness profile; $t = 2.0 \cdot 10^{-3}$ s

4) The computation is stopped at $t = 2.0 \cdot 10^{-3}$ s. The film thickness profile is now similar to the steady-state result.

The film shape starts changing at $t = 0.0$ s. After the term h_{00} is frozen, the film thickness should approach the appropriate steady-state solution. However, transient phenomena disappear very slowly in comparison with the interval of the impact itself. Figures 1–6 show transient film thickness shape at different times. Note that the impact itself takes $2.0 \cdot 10^{-5}$ s only. We can see that the profiles are very similar (qualitatively, at least) to those presented by the authors.

The foregoing analysis suggests that the dimple effect can be initiated by impacts, load changes, or other disturbances caused by the apparatus running, even when the Newtonian behavior of lubricant is supposed. Moreover, it seems, that the *dimple is more transient than steady-state phenomenon.*

In conclusion, I would like to pose the following questions, that might be helpful for further research, to the authors:

1) Is the interference fringe pattern stable in time?

2) Is the experimental apparatus running stable? Does it depend on velocity?

3) The authors reported that no dimple was observed when the steel ball was moving while the glass was stationary ($\Sigma = -2$). In the opposite case, when the glass was moving ($\Sigma = 2$), the dimple was observed. Is our conclusion correct that in the first case the apparatus running is much smoother than in the second case?

4) What is the time of interference pattern recording? (20 μs flash duration or higher?)

5) Is there a synchronization between the camera and revolutions of the disk?

Authors' Closure

The authors would like to thank Mr. Cermak for his interesting comments. First of all, it should be mentioned that the authors have already observed a phenomenon obtained by his numerical simulation although its experiment has been carried out under pure sliding reciprocation with cyclic impact loading.[1] The authors believe that the solidification of oil is indispensable to the occurrence of the dimple phenomena pointed out in the present study.

The answers to questions raised by Mr. Cermak are as follows:

(1) The interference fringe pattern was very stable in time and could be observed over a long period of time.

(2) The experimental apparatus worked very smoothly for $\Sigma = 2$ and $\Sigma = -2$ within the limits of this experiment.

(3) A synchronization between the camera and revolutions of the disk was perfect.

[1] Nishikawa, H., and Kaneta, M., 1995, "Traction in EHL under Pure Sliding Reciprocation with Cyclic Impact Loading," *JSME International Journal*, Series C, Vol. 38, No. 3, pp. 568–576.