DUBBLE – EXPERIMENT REPORT

Beam time number:		File number:
26-02-668 - Shedding light on propagation of oriented crystals		P33094 (proposal file number)
Beamline: BM26-B	Date(s) of experiment: 08/11 – 11/11 2013	Date of report: 25-03-2014
Shifts: 9	Local contact(s): dr. G. Portale	

1. Who took part in the experiments?

Peter Roozemond[1]
Martin van Drongelen[1]
Enrico Troisi[1]
Zhe Ma[1]

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2. Were you able to execute the planned experiments?
YES. All the planned experiments were performed. We were able to monitor the structure evolution after flow conditions relevant to processing.

3. Did you encounter experimental problems?
NO. After some issues in getting the setup working, which we could not have done without the excellent help of Daniel Hermida-Merino, we were able to get the experimental data that we were looking for.

4. Was the local support adequate?
YES. The support of the local contacts and the technical staff was needed to accurately set up the (large) experimental equipment.

5. Are the obtained results at this stage in line with the expected results as mentioned in the project proposal?
YES. We were able to measure crystallization kinetics within the slit for various flow conditions. Remarkably these prove to be largely independent of flow condition (see Fig. 1). This result reveals a self-regulating effect; the shish that are formed during flow have such a drastic effect on the rheology that above a certain specific shish length further structure formation is halted.

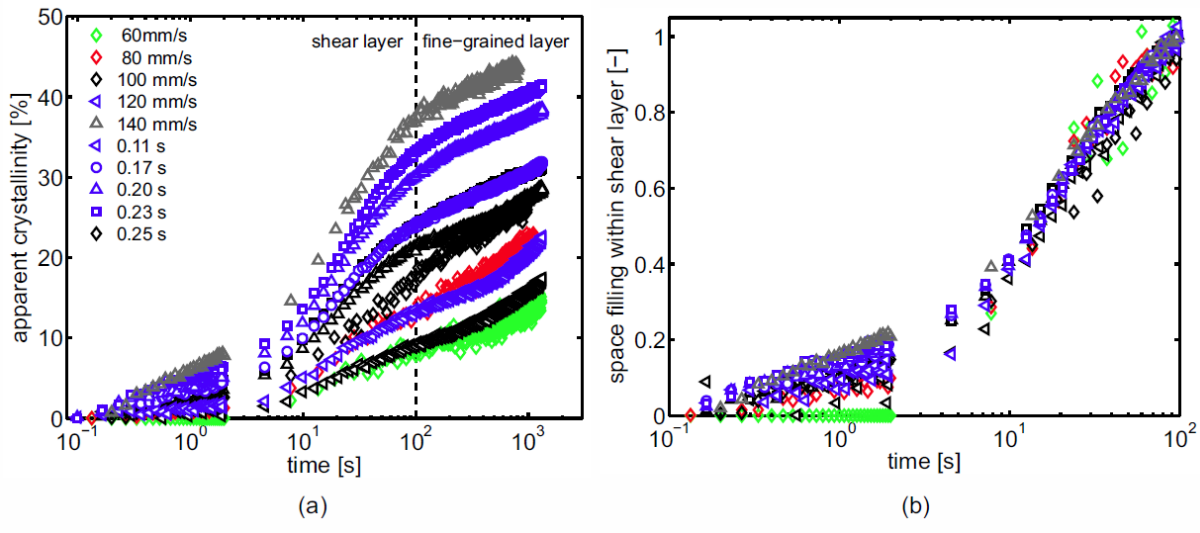

Figure 1: (a) Apparent crystallinity and (b) space filling within shear layer for various flow conditions.

6. Are you planning follow-up experiments at DUBBLE for this project?
YES. The MPR has proven to be of such value that later this year we will perform similar measurements on other materials (PLA, UHMWPE).

7. Are you planning experiments at other synchrotrons in the near future?
NO.

8. Do you expect any scientific output from this experimental session (publication, patent …)
YES. A paper is preparation which will be submitted within the coming weeks.

9. Additional remarks