## Annual Report – 2006

## Activity of Ariel's User Center in the part concerning MALCAM Co. Prepared by Prof. Boris Kapilevich, December 25, 2006

1. Basic areas of service provided by User Center during 2006:

- Testing and calibration of different microwave/mm-wave devices developed by MALCAM Co. (antennas, mm-wave sources, attenuators, modulators, etc.). Example of experimental setup assembled for calibration and testing W-band IMPATT source is shown in Fig.1.
- Design and realization of laboratory prototypes of different devices developed and manufactured by MALCAM for microwave/mmwave characterization of different materials (Teflon powder, cosmetics and pharmaceutical powders, cheese, wood chips, gypsum plates, etc). The User Center has performed such a service using both free space, waveguide and resonator methods depending on customer's needs. Examples of the assembled experimental setups are shown in Fig.2 (overmoded resonator for testing Teflon powder in W-band), Fig. 3 (free space testing gypsum plates), Fig.4 (free space testing of wood chips), and Fig.5 (free space testing of cheese sample).
- Publications and presentations: Some of the results associated with the above mentioned service are unique and deserve publications in professional Magazines as well as presentations at professional forums as listed below:

Article: "Density-independent moisture measurements of polymer powders using a mm-wave quasi-optical resonator" authors: B. Kapilevich, B.Litvak, V.Wainstein, D.Moshe, accepted for publication at the Int. Journal of Meas. Sci. Technol. in 2007 ref no. MST/224280/FEA/148626.

Conference paper: "Determination of Temperature Correction Moisture's Factor of Low Loss Polymer Powders on MM-waves" authors: B.Kapilevich, B.Litvak, D.Moshe, V.Wainstein, A.Grinwald, acceped for presentation at the 7<sup>th</sup> Conference on Electromagnetic Wave Interaction with Water and Moist Substances, Japan, April 2007 (there is the official letter of acceptance from the Conference Chair – prof. S,Okamura)



**Fig.1** The setup designed and assembled by the User Center used for testing and calibration of the output power of the IMPATT source operating at 94GHz.



Fig.2 The setup designed and assembled by the User Center based on overmoded quasi-optical resonator assembled for testing Teflon powder on mm-waves.



Fig.3. Experimental setup designed and assembled by the user Cenetr for testing and characterization of gypsum plates on mm-waves.



Fig.4. Experimental setup designed and assembled by the User Center for testing and characterization of wood chips on microwaves.



Fig.5. Experimental setup designed and assembled by the User Cenetr for testing and characterization of cheese on microwaves.