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(71) Applicant: **KLA-TENCOR CORPORATION** [US/US];
Legal Department, One Technology Drive, Milpitas, California 95035 (US).

(72) Inventors: **YONI, Shalibo**; Ha-Yasmin str. 5, Binyamina (IL). **PASKOVER, Yuri**; 32A Seora Str, 30560 Binyamina (IL). **LEVINSKI, Vladimir**; Hermon 9, 23100 Migdal HaEmek (IL). **MANASSEN, Amnon**; 10 Golda Meir Street, 34892 Haifa (IL). **EISANBACH, Shlomo**; 1 Halavian St., 23100 Migdal HaEmek (IL). **LAREDO, Gilad**; 1 Halavian St., 23100 Migdal HaEmek (IL). **HILDESHEIM, Ariel**; 1 Halavian St., 23100 Migdal HaEmek (IL).

(74) Agent: **MCANDREWS, Kevin** et al.; Kila-Tencor Corporation, Legal Department, One Technology Drive, Milpitas, California 95035 (US).

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(54) Title: OFF-AXIS ILLUMINATION OVERLAY MEASUREMENT USING TWO-DIFFRACTED ORDERS IMAGING

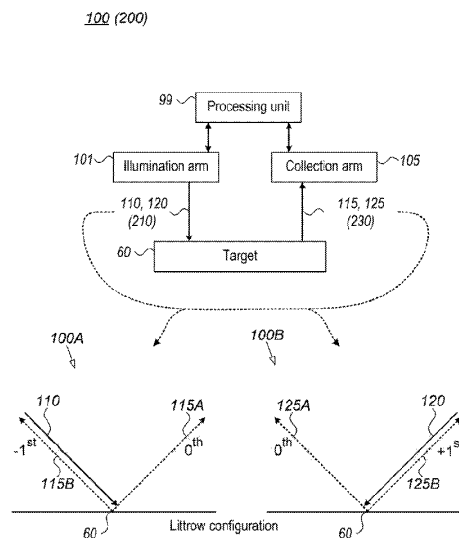


Figure 1

(57) Abstract: Metrology methods and tools are provided, which enhance the accuracy of the measurements and enable simplification of the measurement process as well as improving the correspondence between the metrology targets and the semiconductor devices. Methods comprise illuminating the target in a Littrow configuration to yield a first measurement signal comprising a -1st diffraction order and a 0th diffraction order and a second measurement signal comprising a +1st diffraction order and a 0th diffraction order, wherein the -1st diffraction order of the first measurement signal and the +1st diffraction order of the second measurement signal are diffracted at 180 to a direction of the illumination, performing a first measurement of the first measurement signal and a second measurement of the second measurement signal, and deriving metrology metric(s) therefrom. Optionally, a reflected 0th diffraction order may be split to yield components which interact with the -1st and +1st diffraction orders.

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