



(51) International Patent Classification:

G01S 7/497 (2006.01) H01S 5/40 (2006.01)
G02B 27/10 (2006.01) H01S 3/10 (2006.01)
H01S 3/00 (2006.01) H01S 3/13 (2006.01)

(21) International Application Number:

PCT/IB2022/052842

(22) International Filing Date:

28 March 2022 (28.03.2022)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

283921 09 June 2021 (09.06.2021) IL

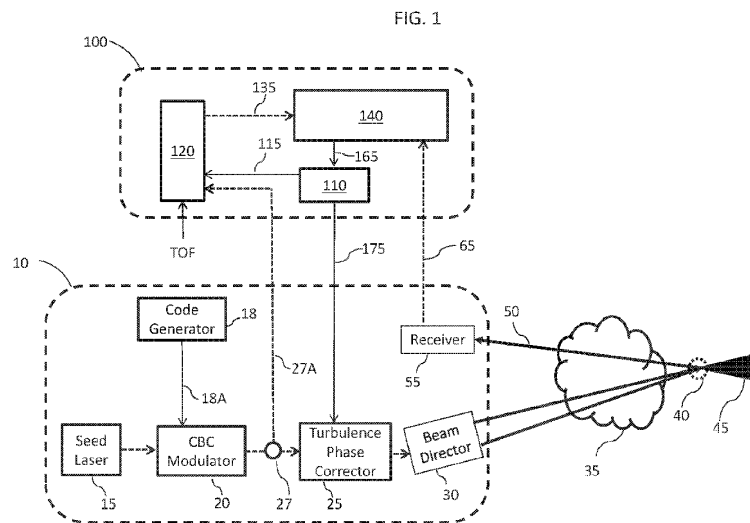
(71) Applicant: **RAFAEL ADVANCED DEFENSE SYSTEMS LTD.** [IL/IL]; P. O. B. 2250, 3102102 Haifa (IL).

(72) Inventors: **GOLUBCHIK, Daniel**; Naomi Shemer 10, 2751419 Kiryat Bialik (IL). **SHWA, David**; Reihan 4B, POB 27, 1524100 Kfar Tavor (IL). **ROGERS, Steve**; 7 Jabotinsky St., Moshe Aviv Tower, 54th Floor, 5252007 Ramat Gan (IL).

(74) Agent: **FRIEDMAN, Mark**; 7 Jabotinsky St., Moshe Aviv Tower, 54th Floor, 5252007 Ramat Gan (IL).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, IT, JM, JO, JP, KE, KG, KH,

(54) Title: COHERENCE RECONSTRUCTION APPARATUS FOR INTERFEROMETRIC MEASUREMENT OF ATMOSPHERIC TURBULENCE



(57) Abstract: A coherence reconstruction apparatus generates measurements of atmospheric turbulence from light reflected by a target. The apparatus is in communication with a coherent beam combining (CBC) system which illuminates a target with one or more partially coherent beams from a seed laser. The apparatus includes a variable delay module and a phase shift interferometer (PSI). The delay module uses a measurement of target time-of-flight to form a coherent delayed reference signal from the CBC seed reference laser. The delay module may incorporate an electromagnetically induced transparency medium and/or an electro-optical modulator. The PSI combines the delayed reference optical signal with a target-reflected optical signal to form an interference pattern and to determine one or more turbulence phase correction measurements. The apparatus may include a controller for generating feedback and dynamic tuning signals.

[Continued on next page]

KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS, ZA, ZM, ZW.

(84) Designated States (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Published:

- *with international search report (Art. 21(3))*
- *in black and white; the international application as filed contained color or greyscale and is available for download from PATENTSCOPE*