**Protocol: MBT Light-Bending Particle Forge (Proof-of-Concept)**

Goal: Detect any measurable deviation (“bending”) of a laser beam in a rotating chamber—under both atmospheric and vacuum conditions—as predicted by MBT, but forbidden by standard GR.

**1. Experimental Setup**

**A. Apparatus**

* Vacuum chamber: Rigid, optically clear (windowed), designed to rotate on a vertical axis (ideally with variable-speed motor, 1–5000 RPM).
* Laser source: Stable, collimated (e.g. HeNe or diode laser, ~1–10 mW).
* Photodetector: High-resolution CCD/CMOS array, quadrant photodiode, or position-sensitive detector to track the beam position with sub-millimeter precision.
* Rotation control: Programmable controller for precise RPM increments.
* Pressure gauge: To confirm vacuum (<10⁻³ Torr) and atmospheric states.
* Calibration grid: Marked reference for initial laser path (baseline, no rotation).

**B. Optional/Recommended**

* Environmental monitoring: Vibration, temperature sensors.
* Automated data logging: Synchronized with rotation speed.

**2. Baseline Measurement (No Rotation)**

* Align the laser across the chamber, hitting the detector dead center (record baseline X,Y).
* Record position and width of the beam spot at rest, under normal atmospheric pressure.
* Repeat for several minutes to establish noise floor (any natural drift/vibration).

**3. Rotation—Atmospheric Test**

* Gradually increase rotation in 1 RPM increments (or logarithmic steps: 1, 5, 10, 20, … up to max safe RPM).
* At each step, hold for at least 1 minute, logging beam position and width continuously.
* Watch for any systematic shift in beam spot (relative to baseline).
* Log all environmental and control data.

**4. Reset & Calibration**

* Power down, let the chamber come to rest.
* Reconfirm alignment and baseline—check for mechanical drift or equipment error.
* If any significant change is observed in the atmospheric test, repeat twice for verification.

**5. Repeat Under Vacuum**

* Pump chamber down to target vacuum (<10⁻³ Torr, lower if possible).
* Re-align and confirm baseline (now under vacuum).
* Repeat the same stepwise RPM sweep, logging all measurements as before.

**6. Data Analysis**

* Compare beam position/angle at each RPM to the baseline for both atmospheric and vacuum runs.
* Quantify any deviation from expected (GR) straight-line propagation.
* Any repeatable, RPM-dependent bending, shift, or non-random movement of the beam (beyond noise floor) is strong evidence for MBT prediction.

**7. Control/Null Test**

* If possible, run a mock trial with the laser off or beam blocked to check for sensor or artifact effects.

**8. Safety**

* Secure all rotating components and use laser safety protocols.
* Ensure all electrical and vacuum equipment is grounded and interlocked.

**Diagram**

(Placeholder for your hand-drawn setup, or use a labeled box diagram in Word/PowerPoint for now.)

**Key Result**

* Success: Any measured, reproducible deviation in beam path vs. GR at any RPM or vacuum state → MBT confirmed, immediate follow-up (e.g. advanced chip material studies, scaling, photon-to-matter experiments).
* Null: No measurable effect → useful negative result, helps calibrate and set upper bounds for MBT effects or guides parameter tuning.

**Next Steps**

* If effect is seen: begin material/graphene chip fabrication in “bending zone,” start iterative R&D for photon-to-matter conversion.
* If not: try higher RPMs, different materials, or refined MBT parameter space.