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Title

The O of_UG.NUG : Substituting Mass with a Count of Existences

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Abstract

This manuscript introduces O of UG.NUG, a quantification method aligned with the UG.NUG Reality that replaces mass with a countable elementary unit O. In the fundamental UG Regime, O is the elementary unit of existence; in the NUG Regime, O acquires a geometric expression called Osilo. Physical quantities are expressed as the integer count N_o of O so that $Q_o = N_o \cdot O$. We state the axioms, provide a reproducible measurement protocol to obtain and record N_o, define rounding and uncertainty rules, and validate additivity and invariance through simple tests and examples.

Conversions to conventional human units are confined to an appendix as a strictly conventional bridge. O of UG.NUG enables direct micro–macro comparisons without treating mass as a primitive, providing the human quantification layer of the UG.NUG Reality.

Introduction

Motivation

Standard physical practice represents mass as a primitive scalar. This human convention hides the distinction between the fundamental UG Regime and the geometric NUG Regime and complicates direct comparisons between microscopic and macroscopic scales. The present work proposes an alternative: adopt a single elementary unit of existence O and treat physically relevant scalars as integer counts N_o of O. In the UG Regime, O is fundamental; in the NUG Regime, O becomes geometrically expressible through Osilo. This separation between fundamental quantities and human conventions yields a simple arithmetic method for scale bridging.

Scope

We present the axiomatic core of O of UG.NUG, the human quantification method of the UG.NUG Reality, used to obtain N_o from measurements, apply discrete assembly rules, perform minimal validation tests, and record data in practical appendices (conversion bridge, templates, submission materials). The manuscript is written for a readership interested in measurement and scale consistency; experimental protocols are intentionally simple and reproducible. O of UG.NUG does not modify the UG or NUG Regimes; it provides the human layer needed to quantify existences without relying on mass.

Axioms and Elementary table

Symbol	Name	Definition
O	Elementary unit	Elementary indivisible unit of existence (1 O)
Q_o	Quantity of existence	$Q_o = N_o \cdot O$
O_s	Osilo scale	Human convenience scale: $1O_s = 10^{12}O$
kg	Kilogram reference	Conventional human unit; see Appendix A

Axioms

- **Axiom 1 Single-unit fundamental principle :** O is the elementary, indivisible unit of existence in the fundamental UG Regime.
- **Axiom 2 Integrality:** Every physically relevant scalar is an integer N_o
- **Axiom 3 NUG expression :** In the NUG Regime, O acquires a geometric expression called Osilo.

For human use, O_s is a conventional multiple of O fixed at 10^{12}.

- **Axiom 4 External conventions:** Conventional units (kg, litre, etc.) are external references and do not appear in the fundamental core.

Operational rules

Allowed operations are integer addition, integer subtraction with nonnegative result, integer multiplication, integer division with floor, and comparisons. Integer division uses floor because fractions of O are fundamentally meaningless in the UG Regime. For nonoverlapping assemblies, additivity holds: $N_o, total = N_o, component$

Spatial rearrangement preserves NO.

3 Methodology

Objective

Provide a reproducible protocol to obtain, record, and validate NO values for objects and assemblies across scales.

Standard procedure

1. **Define sample and protocol:** specify object identity, measurement method, instrument model, resolution, and environmental conditions.
2. **Acquire primary measurement:** record instrument reading in its native units. Do not introduce mass as a primitive in the main text.

3. **Translate to NO:** if the instrument yields NO directly, adopt it; otherwise use the conversion bridge in Appendix A and record conversion provenance.
4. Check integrality:

   for converted value x
   if $x \in \mathbb{N}$ set $N_O = x$
   otherwise compute $\tilde{N}_O = \text{round}(x)$
   and residual $\Delta N_O = x - \tilde{N}_O$

5. **Controls:** repeat measurements, use independent methods where possible, and run additivity tests on components.
6. **Record metadata:** store N_O

   store N_{O_s} if used
   store instrument uncertainty U_{instr} expressed in O
   ΔN_O
   conversion provenance
   environmental conditions

Rounding and uncertainty rules

Rounding rule:

$\tilde{N}_O = \text{round}(x)$.

Residual: $\Delta N_O = x - \tilde{N}_O$ recorded in O.

Thresholds: if $|\Delta N_O| \le U_{\text{instr}}$

treat rounding as noncritical;

if $|\Delta N_O| > U_{\text{instr}}$

improve precision or aggregate repeated measures and round the mean.

Aggregation: for repeated measures x_i,

$$\text{compute } \bar{x} \text{ and } \sigma \text{ in } O;\ \text{set } \tilde{N}_O = \text{round}(\bar{x})$$
$$\text{and report } \sigma \text{ and } \Delta N_O = \bar{x} - \tilde{N}_O.$$

Data recording template (Appendix B provides ready forms)

Record Sample ID, instrument and method, primary reading, conversion used, converted value x in O, rounded value N~O, residual ΔNO, instrument uncertainty Uinstr, decision and comments.

4 Discrete assembly rules and minimal tests

Assembly primitives

- **Alignment:** linear concatenation of O units; total count equals the sum of aligned units.
- **Paving:** discrete tiling to form surfaces; surface count is the discrete product of counts along orthogonal directions.
- **Stacking:** layered stacking to form volumes; total count is the sum of layers.

Minimal validation tests

- **Test Integrality:** convert a representative sample (particle proxy, grain, small object, 1 kg reference) to O and compute ΔN_O
- Success criterion: at least 90 percent of conversions satisfy $|\Delta N_O| \leq U_{\text{instr}}$.

- **Test Additivity:** measure components A, B, C and assembled object T; verify $\tilde{N}_{O,T} = \tilde{N}_{O,A} + \tilde{N}_{O,B} + \tilde{N}_{O,C}$ within documented residuals.

- **Test Invariance:** rearrange the assembly (paving, stacking) and verify N_O is unchanged.

Representative numerical examples (for illustration only)

Case	Value_in_O	Value_in_O_s	Notes
Reference 1 Os	$10^{12}\,O$	$1\,O_s$	Human-scale reference
1 kg conventional	$10^{36}\,O$	$10^{24}\,O_s$	Conventional unit (external)
Example object A	$4.237 \times 10^{24}\,O$	$4.237 \times 10^{12}\,O_s$	All numerical values in this section are illustrative only and do not encode physical claims.

Components B C D	$10^{12}\,O$ $2\times10^{12}\,O$ $3\times10^{12}\,O$	$1\,O_s$ $2\,O_s$ $3\,O_s$	Three components

Everyday example. A commercial transaction such as buying "1 kg of tomatoes" relies on the human-scale kilogram reference without requiring knowledge of the internal composition of the tomatoes. In UG.NUG terms, the kilogram is a NUG-level conventional unit, while the quantity of existence belongs to the UG regime. O of UG is immediately applicable in such cases: the same sample can be assigned an integer count N_o using the conventional bridge in Appendix A, making the framework directly usable in everyday measurement contexts.

5 Discussion and conclusion

Gendered uniformity

The asymmetry between microscopic uniformity and macroscopic heterogeneity can be related to the notion of *uniformité genrée*, introduced by Bohane in a non-academic essay to describe the perfect identity of microscopic entities contrasted with the intrinsic uniqueness of macroscopic objects. Although ubiquitous, this phenomenon is rarely articulated in scientific literature because it lies across disciplinary boundaries. It implies that human-scale measurements can assign a single quantitative value to mixed materials in undefined volumes, while microscopic descriptions require specifying constituents and structure. O of UG.NUG addresses this methodological gap by providing a single operation — the assignment of an integer count N_O — that applies equally to uniform microscopic entities and heterogeneous macroscopic samples, independently of composition.

Advantages

UG.NUG reality provides ontological clarity by reducing primitives to a single countable unit, enforces integrality that simplifies micro–macro comparisons, and makes rounding and uncertainty explicit in the same unit as the quantity.

Limitations

Communicating results in conventional units requires a conversion bridge and may face resistance. Integer counts of O can be numerically large, raising storage and computational considerations. Instruments produce real-valued outputs; community agreement on rounding and aggregation protocols is necessary.

Outlook

Develop open-source tools for conversion and record keeping, run pilot experimental studies to test practical utility, and pursue philosophical analysis of measurement implications.

Conclusion

UG.NUG reframes physical quantity by counting elementary existences rather than invoking mass as a primitive. The framework is operational, reproducible, and ready for empirical trials under the protocols provided.

Appendix A Passerelle conventionnelle

Placement: This appendix is outside the ontological core and must not be used in axioms or fundamental equations.
Definition: $1\,O_s = 10^{12}\,O$
Conventional bridge:
$1\,\mathrm{kg} = (O_s)^3 = 10^{36}\,O$
This mapping is not derived from physical principles; it is a purely conventional scaling choice external to the ontological core.
Conversion rule: For a measurement x in kilograms
$N_O = x \times 10^{36}$
Note: This conversion is strictly conventional and external to O of UG.NUG

Appendix B Data templates and example records

Measurement record template

Record A-001

Method: *conventional balance reading*
Primary reading: 0.004237 kg
Conversion used: Appendix A
Converted value x in O: $4.237 \times 10^{33}\,O$
Rounded value N_O_tilde: $4.237 \times 10^{33}\,O$

Residual $\Delta N_O : 0$
Instrument uncertainty $U_{\text{instr}} = 1 \times 10^{29}\, O$
Decision: noncritical

Comments: residual within instrument uncertainty

Record B-010

Method: spectrometric particle proxy
Primary reading: $x = 2.3456 \times 10^{18}\, O$
Conversion used: none (instrument outputs directly in O)
Converted value x in O: $2.3456 \times 10^{18}\, O$
Rounded value N_O_tilde: 2,345,600,000,000,000 O
Residual $\Delta N_O : 0$
Instrument uncertainty $U_{\text{instr}} = 5 \times 10^{14}\, O$
Decision: noncritical

Comments: rounded to nearest integer

Record C-100

Method: assembly of three components measured separately

Primary readings:

- comp1: $1.0 \times 10^{-12}\, \text{kg}$
- comp2: $2.0 \times 10^{-12}\, \text{kg}$
- comp3: $2.0 \times 10^{-12}\, \text{kg}$

Converted values in O:

- comp1: $1.0 \times 10^{24}\, O$

- comp2: $2.0 \times 10^{24}\,O$
- comp3: $3.0 \times 10^{24}\,O$

  Rounded values: identical to converted values
  Residuals: 0
  Instrument uncertainty $U_{\text{instr}} = 1 \times 10^{20}\,O$
  Additivity: confirmed

Total: $6.0 \times 10^{24}\,O$

Appendix C Submission materials

Short abstract 100–150 words

O of UG.NUG introduces a minimal operational ontology that replaces mass with a countable elementary unit O. Physical quantities are expressed as the integer count N_O of $O^{\#}$, so that $Q_o = N_O \cdot O$. The manuscript states axioms, provides a reproducible measurement protocol to obtain and record N_O, defines rounding and uncertainty rules, and validates additivity and invariance through simple tests and examples. Conversions to conventional units are confined to an appendix as a purely conventional bridge. UG.NUG aims to enable direct micro–macro comparisons without treating mass as a primitive and to offer a practical framework for empirical testing and methodological standardization.