1. Shift the claim: from “new result” → “new representation of known results”

Right now the manuscript says “pedagogical,” which is safe but undersells it.

A stronger, but still honest framing is:

> *“This paper introduces a minimal parameterization and regime-based representation that makes several classical results simultaneously visible and comparable within a single coordinate system.”*

That’s not trivial—it’s a **representation-level contribution**.

What’s actually new here?

- Putting **perimeter and area scaling together** in the same parameter space
- Making N/r and N/r^2 the *primary control variables*
- Embedding examples into a **shared geometric phase space**

This is closer to:

- a *coordinate transformation of the theory*, not a new theorem

---

2. Explicitly claim a “change of variables” contribution

Right now the paper uses (N, r), but doesn’t fully exploit it.

A sharper framing:

> The framework induces two derived control parameters:
>
> - $\alpha = N/r$ (perimeter growth factor)

> - $\beta = N/r^2$ (area growth factor)

Then argue:

- Classical fractal analysis is expressed in terms of **dimension** D
- This paper instead uses **growth ratios** (α, β)

👉 That is a **nontrivial reframing**, because:

- it separates *boundary growth* from *area accumulation*
- it makes the tradeoff structure explicit

This is the closest thing you have to real conceptual novelty.

---

3. Reframe the classification as a bifurcation diagram

Avoid “phase diagram” (you already corrected that), but you can still say:

> “The parameter space exhibits **qualitative regime transitions** defined by the surfaces $N = r$ and $N = r^2$.”

Then emphasize:

- These are **not new inequalities**
- But they are used here to define a **joint classification of two observables**

That’s the key:

👉 Classical literature:

- focuses on **dimension**

👉 This paper:

- classifies **(perimeter behavior, area behavior)** jointly

That *pairing* is the novelty.

---

4. Elevate the additive vs subtractive distinction

This is actually the strongest underclaimed idea in the paper.

Right now it's presented as a clarification. You can strengthen it to:

> "The paper introduces a construction-class refinement showing that identical parameter regimes ($r < N < r^2$) can yield qualitatively different measure-theoretic outcomes depending on whether the construction is additive or subtractive."

Why this works:

- Same (N, r), same D
- **Different asymptotic area behavior**

That is a **structural non-equivalence** inside the same dimension class.

👉 That's genuinely insightful at the high-school research level.

---

5. Reframe as a unifying diagnostic framework

Instead of claiming new math, claim new *use*:

> "The framework functions as a diagnostic tool: given (N, r) and construction class, one can immediately infer asymptotic perimeter and area behavior without re-deriving each example."

This positions the contribution as:

- compressing multiple derivations into a **lookup structure**

That's:

- not new math,
- but new **operationalization**

---

6. Add a "what becomes simpler" paragraph

Right now, the paper doesn't explicitly demonstrate *why the framework is useful*.

Fix that by stating:

Without the framework:

- each fractal requires separate derivation

With the framework:

- behavior follows from:
  - $N/r \rightarrow$ perimeter
  - $N/r^2 \rightarrow$ area
  - construction class → measure outcome

👉 This makes the contribution feel like a **theory compression result**

---

7. What to explicitly NOT claim

The author should **avoid**:

- "new theorem"

- “new condition”
- “novel discovery of regime”
- any implication that $r < N < r^2$ is new

You would (correctly) reject that immediately.

---

8. A concrete rewrite (you could suggest this)

Here’s a tight version the author could drop into the introduction:

> “While the condition $1 < D < 2$ for planar fractal dimension is classical, existing treatments typically analyze individual constructions in isolation. This paper introduces a minimal parameterization and regime-based representation that recasts these results in terms of two growth ratios, N/r and N/r^2, which govern boundary expansion and area scaling, respectively. Within this representation, multiple classical examples can be located within a single parameter space, revealing that identical dimension regimes can produce distinct measure-theoretic outcomes depending on construction class. The contribution is therefore not a new theorem, but a unifying framework that makes these relationships explicit and directly comparable.”

That would pass a serious reviewer.

Bottom line

The author’s path to “novelty” is:

- × not new mathematics
- ✅ new **representation + synthesis + classification + interpretability**

If framed this way, the work becomes:

> "conceptually original but mathematically conservative"

—which is exactly where a strong JHSS paper should land.

If you want, I can rewrite the **abstract and conclusion** to fully reflect this stronger (but still honest) positioning.

yes

Here's a **clean, publication-ready rewrite** of the **Abstract and Conclusion** that strengthens the contribution without overclaiming. It keeps the tone rigorous and defensible under close review.

🔹 Revised Abstract

This paper develops a unified representation for a class of self-similar planar constructions using two parameters: the number of self-similar pieces N and the inverse linear scale factor r. While the condition $1 < D = \log(N)/\log(r) < 2$ for non-integer planar fractal dimension is classical, existing treatments typically analyze individual constructions in isolation. The present work recasts these results in terms of two derived growth ratios, N/r and N/r^2, which govern perimeter scaling and area scaling, respectively.

Within this representation, the parameter space is partitioned into three regimes defined by the inequalities $N \leq r$, $r < N < r^2$, and $N \geq r^2$, corresponding to qualitatively distinct asymptotic behaviors. In the intermediate regime $r < N < r^2$, perimeter diverges while area behavior depends on construction class. The paper introduces a refinement distinguishing additive constructions, in which the object of interest is a region bounded by the iterated curve, from subtractive constructions, in which the object is the iterated set itself. Within the same parameter regime, these classes exhibit different measure-theoretic limits: additive constructions yield positive finite area under a stated non-overlap assumption, whereas subtractive constructions yield zero area.

Four examples—the Sierpinski triangle, Sierpinski carpet, Koch snowflake, and a Koch-style construction on a square—are analyzed within this framework. The contribution is not a new mathematical theorem, but a unifying parameter-space representation that makes the relationship between boundary growth, area scaling, and construction class explicit and directly comparable across examples.

🔹 Revised Conclusion

This paper has presented a parameter-space representation for a class of deterministic self-similar planar constructions, organized by the pair (N, r) and the derived growth ratios N/r and N/r^2. Within this representation, perimeter growth and area scaling are governed by simple multiplicative factors, allowing the asymptotic behavior of a construction to be inferred directly from its parameters and construction class.

The condition $r < N < r^2$, equivalent to similarity dimension $1 < D < 2$, identifies the regime in which perimeter diverges. However, the framework shows that this condition alone does not determine the behavior of area: constructions within the same parameter regime can exhibit qualitatively different measure-theoretic limits depending on whether they are additive or subtractive. This construction-class refinement highlights a structural distinction that is not apparent when examples are treated individually or classified solely by dimension.

The framework functions as a compact diagnostic tool: given (N, r) and a specification of construction class, one can determine whether perimeter diverges, whether area converges, and whether the limiting measure is zero or positive (subject to stated assumptions such as non-overlap). In this sense, the contribution lies in a change of representation that consolidates multiple classical results into a single, interpretable structure.

The scope of the framework is limited to deterministic self-similar constructions satisfying the assumptions stated in Section 2. Extensions to mixed constructions, overlapping geometries, or stochastic fractal models require separate analysis and are not addressed here. Within its scope, however, the representation provides a unified and transparent way to compare canonical examples and to understand how boundary growth and geometric measure interact across different constructions.