

SphereWave TransFormation v0.9.72

Note: The original document is in Korean. This translation may contain errors; if anything conflicts, the Korean original takes precedence.

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1. Introduction

A spherical-wave transformation tool for the lilToon and Poiyomi editions. When sets are attached to an avatar, NDMF build generates the spherical-wave transition and Expression menu. The original sets, materials, meshes, and the installed lilToon / Poiyomi files are not modified.

Do not overwrite or merge the lilToon and Poiyomi editions into the same folder. Two modules on one avatar are not supported. Updates are designed so that overwriting with the new version alone is enough to continue using it, but unexpected issues can occur. In that case, the creator recommends deleting the existing spherical wave from the avatar and project, then installing fresh.

2. Requirements

- VRChat avatar Unity 2022.3.22f1 (PC)
- Modular Avatar (includes NDMF)

- lilToon or Poiyomi Toon/Poiyomi Pro

2-1. Expected Support Range (as of 2026-09-20)

- Unity: 2022.3.22f1
- VRChat SDK Avatars: 3.10.4 – 3.10.5
- NDMF: 1.14.1 – 1.14.8
- Modular Avatar: 1.18.0 – 1.18.7
- lilToon: 2.3.0 – 2.3.4
- Poiyomi Toon / Pro: 9.3.x – 10.0.16

3. Quick Start

- **1-bit**: transition between 2 sets (toggle)
 - **8-bit**: transition among 3–8 sets (select from a list)
1. From the SphereWaveTransFormation folder root, place the "SWTF 1-bit" or "SWTF 8-bit" prefab that matches the shader in use (lilToon or Poiyomi) directly under the avatar (the root that has the Avatar Descriptor).
 2. Place MA Compatibility directly under the SphereWave module.
 3. In the module inspector, assign each set's top-level object used for the transition to the Outfit 0 Root / Root slots. (Outfit 0 / Slot 0 = default set)
 4. With the module selected, verify with "Enter Play Test (Live Preview)".
 5. Build/upload the avatar with the VRChat SDK to apply it in-game.

Change menu names with Toggle Name (1-bit) / Submenu Name · Button Name (8-bit). The default transition shape is spherical; to use plate movement, set Sweep Shape under Sphere Center to Plate. (6-2)

4. SWTF

This is the inspector for the "SWTF 1-bit" or "SWTF 8-bit" prefab. Configure sets, menu, and Visual Profile here. Wave center and shape are set on the child "Sphere Center". (Chapter 6)
For preview, use "Enter Play Test (Live Preview)". (Chapter 5)

- **1-bit**: Outfit 0 Root (Default / OFF) / Outfit 1 Root (ON) Toggle Name: the toggle name shown in the Expression menu.
- **8-bit**: Outfit Count (3–8), Root · Button Name under Outfit Slots Submenu Name: the submenu name.
- If several objects must change together—such as clothes, hair, or props—group them under the same parent and assign that parent to Outfit 0 Root / Root. (Only the top-level object goes in each slot.)

- **Install Into Submenu (Optional)** Assign a submenu asset from the avatar's Expressions Menu to create the menu inside it. Leave empty to create the menu at the root.
(If the root menu is full (8 slots), Modular Avatar usually creates the next page. That step can occasionally fail, and the menu button may not be created. In that case, use Install Into Submenu to place it in a submenu that has a free slot, or free a root slot.)

4-1. Visual Profile

- Pattern Texture / Color / Opacity / Threshold / Tiling: wave surface pattern
- Edge Width / Legacy Pattern: pattern edge width; pattern mode
- Appearing Color / Opacity / Width: boundary on the appearing side
- Disappearing Color / Opacity / Width: boundary on the disappearing side

5. Enter Play Test (Live Preview)

Enter via "Enter Play Test (Live Preview)" in the inspector. For 8-bit, choose Target Outfit, then verify with Progress / Auto Play. Visual Profile and the center point can be edited not only in Play Test but also on the module / Sphere Center in Edit mode. The center may also be moved by dragging the child "Sphere Center" object. "Save Current Test Values" must be pressed for changes to apply to the original after Play ends.

6. Sphere Center

This is the child "Sphere Center" object of the SphereWave module. Set the reference point from which the wave expands, plus radius, timing, and shape here. In Edit mode, move the object directly, or adjust the values below under Sphere Center Settings. It can also be opened with "Open Sphere Center Settings" on the SWTF inspector. Use Sweep Shape to choose spherical (Sphere) or plate movement (Plate).

6-1. Center Point & Shape (Sphere)

The radius options below apply when using the spherical shape; for plate movement, see 6-2.

- Auto Range: when on, End Radius (m) is auto-calculated from meshes belonging to the sets the wave applies to. Auto Range Margin (m) adds a little extra outward room.
- Start Radius (m) / End Radius (m): the sphere radius where the wave starts and ends. When Auto Range is off, enter End Radius (m) directly.
- Duration (s): how long the wave progresses for one transition.
- Progress Mode: how the radius grows over time. Exponential uses Acceleration K for an accelerating feel; Custom Curve lets you draw the 0→1 progress curve yourself.

In Play Test, "Sphere Center Test" supports Scene handle moves, "Move Center to Viewpoint", "Auto-Calculate Radius from Current Center", and more. (Handle and radius guides appear only when Scene View Gizmos and "Show Center / Radius Guides in Scene View" are on.)

Checking Auto Range in Edit alone does not change the End Radius (m) number immediately; "Calculate End Radius from Current Outfit" must be pressed for the field to fill. At upload/build time, if Auto Range is on, it is calculated then automatically.

6-2. Plate Movement (Plate)

Changing Sweep Shape to Plate makes a plate travel from start to end plate instead of a growing sphere. Duration and Progress Mode are the same as for the sphere.

- Plate Start Offset / Plate End Offset: start and end positions relative to Sphere Center; the line between those two points is the plate's travel direction. (Same position blocks the build.)
- Auto Plate Fit: keeps direction as-is and automatically widens plate size and range at build to cover the sets.
- Plate Size (m) / Plate Margin (m): plate width/height and outer margin. "Fit Plate to Current Outfit" fills values based on the current set immediately.
- In Play Test's "Plate Test", handles can be moved and auto-fit applied.

Outside the plate, the previous appearance is kept until the transition finishes, so the plate must cover the sets. In plate movement the pattern is aligned to the plate, so switching from spherical may require retuning the pattern.

7. MA Compatibility (Optional)

Use this when Modular Avatar Shape Changer (Heel Set / Delete, etc.) changes BlendShapes during set transitions and the resulting awkwardness needs to be fixed. If needed, place one "MA Compatibility" prefab from the SphereWaveTransFormation folder directly under the SphereWave module. (Without it, this integration is off.)

Modes (MA Compatibility inspector)

Auto (default)

- Brings detected MA Set/Delete targets into Body Patch. Even if Set/Delete and Delete Threshold differ per set, each set's state is stored, and during transition the change is applied once at the midpoint of the interval when the wave passes the affected BlendShape region (midway between first contact and full cover).

Link

- SphereWave does not apply Body Patch to MA Shape Changer. Per-set MA values and Delete follow Modular Avatar's rules as-is.
- If an MA setup adjusts the same shape key multiple times with different values/Thresholds within the same set, that target is skipped.
- For other fine-grained needs, MA Compatibility may need to be removed and adjusted manually.

8. Resource Cost

Sync parameters (256-bit limit)

- 1-bit (2-set toggle) : 1 Bool (1 bit)
- 8-bit (3–8 set transition): 1 Int (8 bit)

※ Bools for the 8-bit menu are local-only (0 bit)

FX layers

- 1-bit : 3
- 8-bit : set count + 2
- When using Body Patch (regardless of registered count) : +1

Texture memory (VRAM)

- With no pattern texture: 0 additional (shares existing textures as-is)
- With a pattern texture: only the one registered image is added

Mesh and materials

- No change in polygon count
- Uses 1 unused UV channel (among UV0–7 as needed)
- If multiple objects share one mesh, they are split one per object

Shader and data size

- Wave materials are replaced 1:1 with the extended shader, so shaders barely increase (original shaders coexist only on parts that do not use the wave)
- A small amount of control animation data is added in proportion to set and renderer count

Transition load

- Previous and new sets render together only while a transition is in progress; simultaneous rendering stops as soon as the transition finishes

9. Shader Support Specs

Supported (applies normally)

- Full lilToon product line on meshes (Multi, Lite, Fur, Gem, Refraction, Tessellation / including cutout, transparent, outline)
- Official Poiyomi Toon · Pro whose source can be read (base Toon/Pro and Fur, World Fur, Wireframe, Geometric Dissolve, ShatterWave, Particle*, Two Pass Particle, Tessellation, Lil Fur, etc.)

※ Particle here is the mesh shader of that name, not a Particle System.

Supported (color not applied)

※ Normal handling to prevent overlapping colors or overly bright shadows. Set transition still works.

- lilToon: additional lighting (Add), Gem prepass, Refraction blur, FakeShadow
- Poiyomi: auxiliary lighting (Add) outside the main pass. Color is applied to Add only when Max blend is used

Unsupported and caveats

- Only set Root ON/OFF without the wave
- Meshes with UV0–7 all in use (no free channel)
- Non-mesh items such as Particle System, Trail, Line
- Shaders other than lilToon · Poiyomi
- Custom / unsupported shaders whose source cannot be read or whose structure differs

Cannot convert (build error)

- lilToon that already has another custom extension
- UsePass pointing outside lilToon
- URP · HDRP. Only VRChat PC Built-in is supported

10. Rules & Notices

Rules

- Place only one SWTF module on an avatar.
- Keep Outfit Root under the avatar; do not place it inside the module.
- Outfit Root must not be the same or nested, and each root must have a Renderer.
- Custom Curve must progress only 0→1 and must not decrease in the middle.
- For plate movement, Plate Start Offset and Plate End Offset must not be the same position.
- When using MA Compatibility, it must be a direct child of the module, and only one per module.

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- Modular Avatar, lilToon, and Poiyomi Toon / Pro are not included in this package. Separate installation is required, and those software licenses must be complied with.
- Detailed terms for support, inquiries, refunds, etc. follow the Booth product page.
- Operation was verified against Unity 2022.3.22f1 / Modular Avatar 1.18.3 (NDMF 1.14.7) / lilToon 2.3.4 / Poiyomi Toon · Pro 9.3 · 10.0.16. Support may be weaker or behavior may differ on other versions. For additional support or combinations with other assets, contact via Twitter (X), Booth, Discord, etc.
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