

# Camera Setup Guide

## Final Cut Camera (iOS) Configuration for Optical Correlation Measurements

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### 1. Purpose

This document describes the camera configuration used to acquire all experimental videos analyzed in this study.

The goal is to ensure **temporal stability, reproducibility, and suppression of automatic camera adaptations** during long-duration recordings of weak optical patterns around a metallic sphere.

All recordings were performed using the **Final Cut Camera** application on an iPhone in **fully manual mode**.

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### 2. Recording Format and Global Settings

- **Codec:** Apple ProRes
- **Resolution:** 4K
- **Frame rate:** 29.97 fps
- **Color mode:** SDR
- **Recording mode:** Video (continuous)
- **Recording duration:** 20 seconds per take

These settings were kept fixed throughout all measurements.

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### 3. Scene Composition and Framing

The camera was mounted on a fixed support.

The scene was composed as follows:

- The **solid steel sphere** was placed on the **right-hand side** of the frame.
- The **left-hand region** was reserved as an observation space for the surrounding background field.
- The sphere was fully visible, with sufficient margin to capture spatial variations around its surface.

This asymmetric framing ensured that both the sphere and the surrounding optical environment were recorded simultaneously.

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## 4. Focus Lock (AF Lock)

Before recording, the camera focus was stabilized as follows:

1. The **center of the sphere** was tapped directly on the screen.
2. **AF (auto-focus) lock** was engaged and confirmed.
3. Focus was not changed for the remainder of the recording.

This step prevented focus hunting and frame-to-frame focal drift.

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## 5. Manual Exposure Configuration

After focus lock, all exposure-related parameters were set manually:

- **Shutter speed:**
  - Fixed within the range  $1/60 - 1/120$  s
- **ISO:**
  - Fixed at **ISO 64**
- **Exposure compensation:**
  - Set to **-0.3 EV**

- **Auto exposure:** Disabled
- **Stabilization and dynamic adjustments:** Disabled

Once set, these parameters were **not modified** during recording.

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## 6. Recording Procedure Summary

In summary, the camera setup procedure was:

1. Launch *Final Cut Camera*.
  2. Select **Apple ProRes, 4K, 29.97 fps**.
  3. Frame the scene with the sphere on the right and background on the left.
  4. Tap the center of the sphere and enable **AF lock**.
  5. Set:
    - Shutter: 1/60–1/120 s
    - ISO: 64
    - Exposure: –0.3 EV
  6. Verify that all automatic adjustments are disabled.
  7. record a continuous 20-second video segment without further interaction
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## 7. Notes on Reproducibility

These settings were chosen to:

- Minimize frame-to-frame luminance drift
- Avoid automatic gain or exposure corrections
- Preserve consistent temporal sampling for cross-correlation analysis

Each recording consisted of a single uninterrupted 20-second clip, providing approximately 600 frames per dataset.

All experimental videos used in subsequent analyses were acquired using this identical configuration.

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(Figure placeholder)

**Figure 1.** Final Cut Camera interface during recording.

The sphere is positioned on the right-hand side of the frame, with the surrounding observation region on the left.

(Reflected personal features on the sphere surface were locally blurred for privacy.)

