



「Design and Development of Compact Multispectral Imaging Telescope for Precision Agricultural and Environmental Monitoring」

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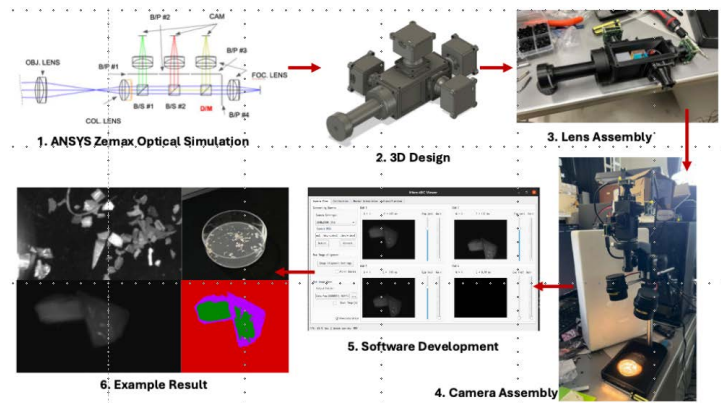
研究室HP <https://www.ep.sci.hokudai.ac.jp/~psg/index.html>

関連キーワード：

研究の目的

- Growing concerns over climate change, resource depletion, & sustainable food production
- Increasing demand for precision agriculture & environmental monitoring
- Limitations of conventional methods & existing nondestructive techniques:
- Challenges in spectral imaging:
 - Mixed pixels due to limited spatial resolution
 - Difficulty detecting small targets (e.g., microplastics, fruitlets)
 - Digital magnification degrades image quality

研究内容



期待される効果・貢献

研究成果

- Development of a compact, high-precision spectral imaging system
- High-resolution imaging (FOV: 26.5 mm × 13.5 mm)
- Preservation of spatial and spectral fidelity through optical design
- Demonstration of real-time classification and estimation
- Optimized spectral band configuration for cost-effective sensing

Technical Impact

- Non-destructive, rapid, and high-precision monitoring
- Accurate detection of small targets (e.g., microplastics)
- Real-time, on-site decision-making capability

Societal Impact

- Advancement of precision agriculture → improved food productivity
- Enhanced environmental monitoring → ecosystem and marine protection
- Contribution to sustainable and resilient society

Policy & Strategic Contribution

- Alignment with Sustainable Development Goals (SDGs):
 - SDG 2: Zero Hunger
 - SDG 12: Responsible Consumption and Production
 - SDG 14: Life Below Water
- Contribution to regional innovation agriculture and environment
- Support for institutional initiatives (GX initiatives and HU Vision 2030)

