Locally Orderless Images for Optimization in Differentiable Rendering

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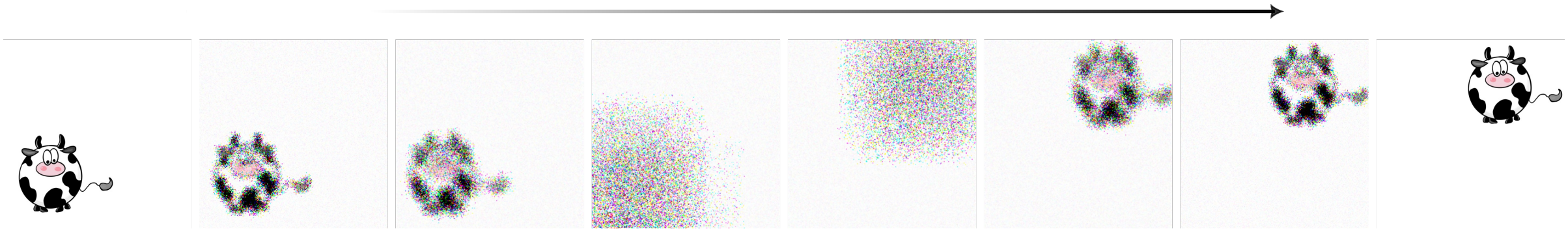
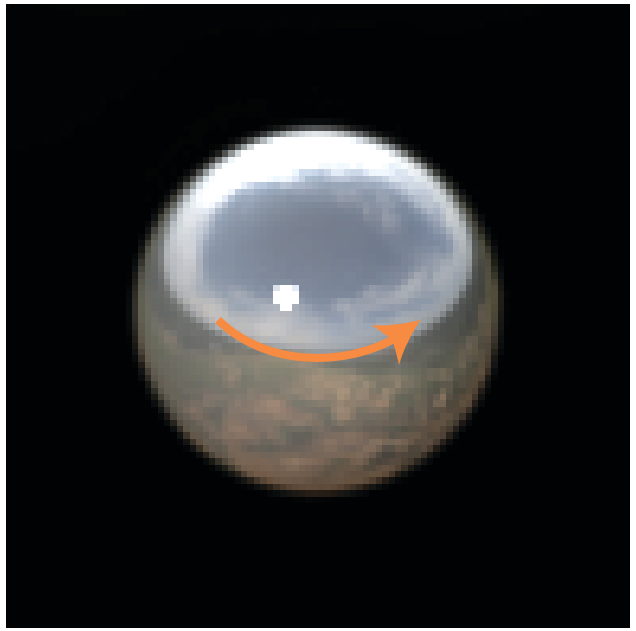
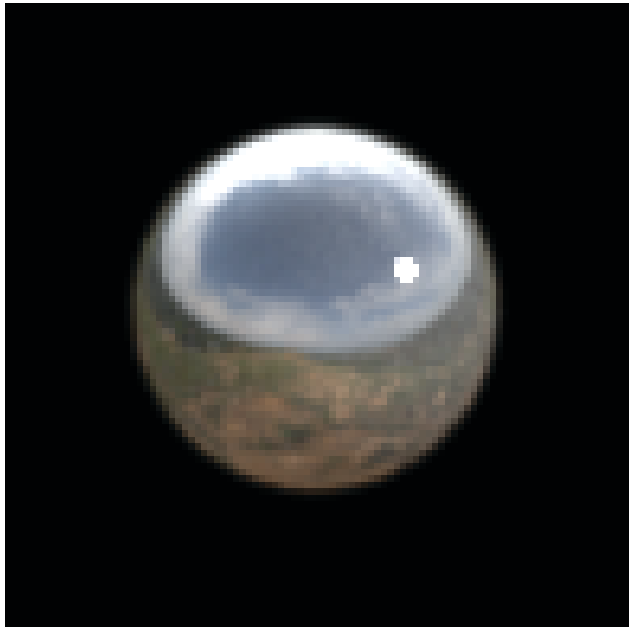


Initial

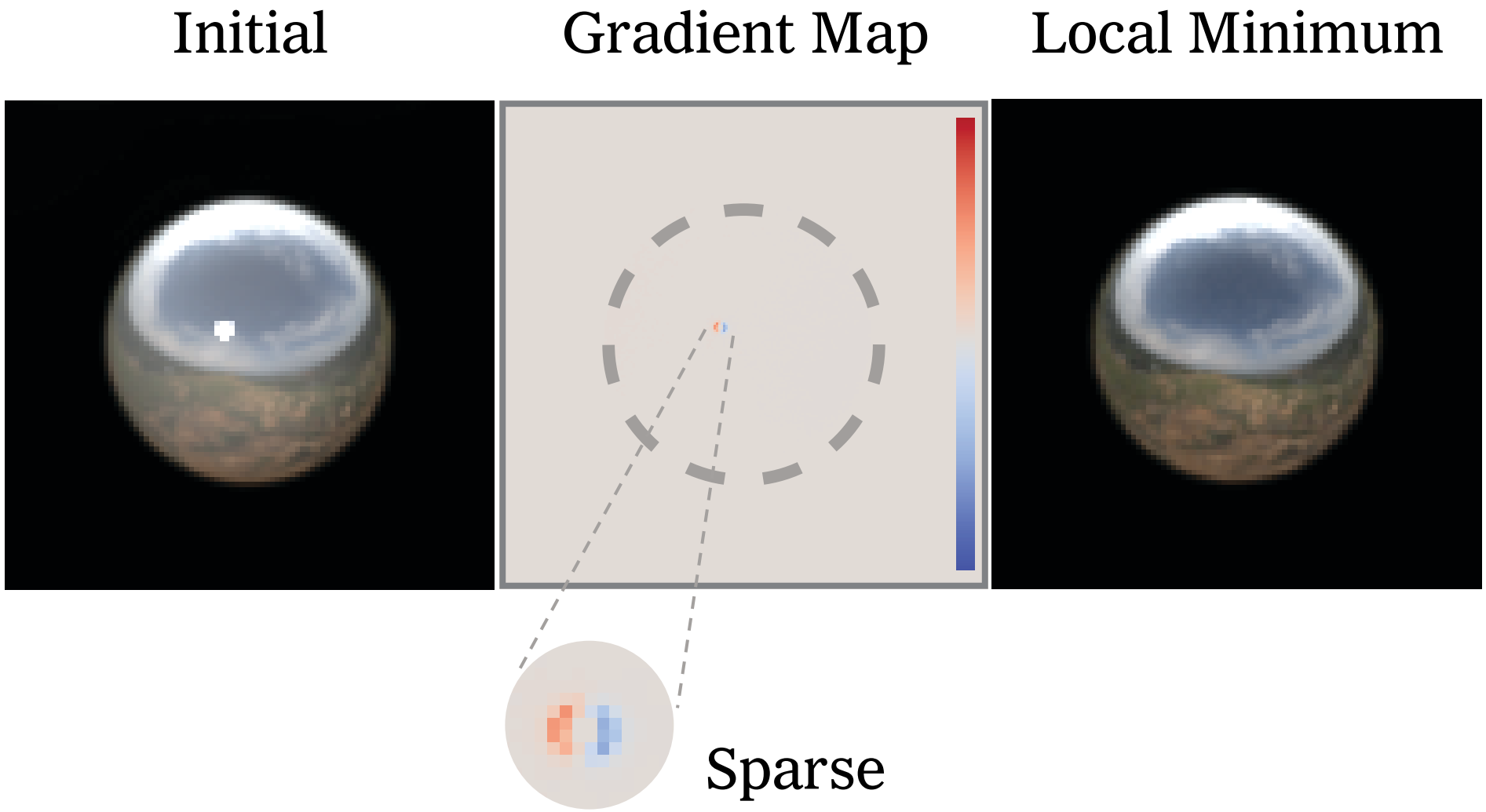


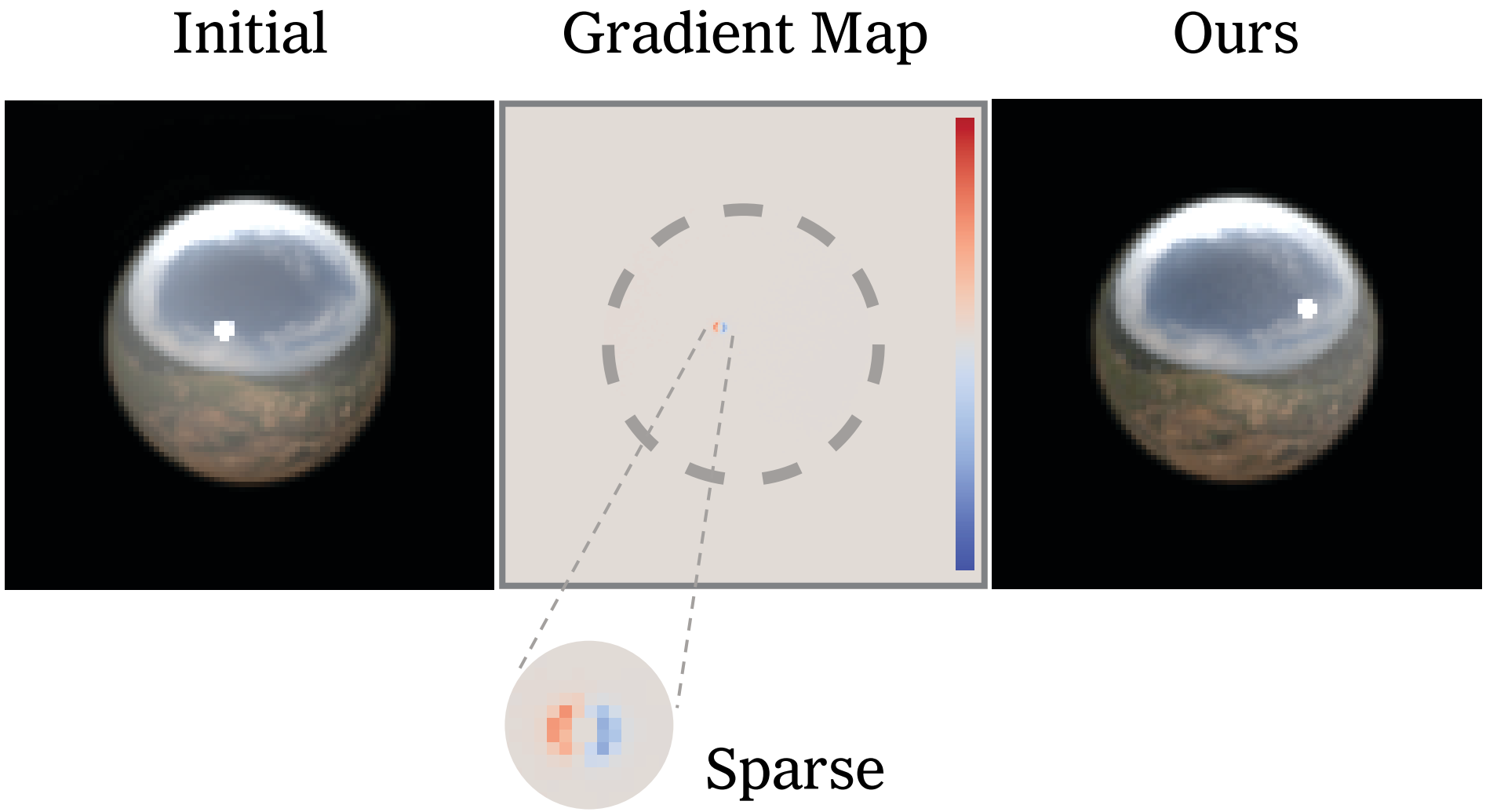
Target



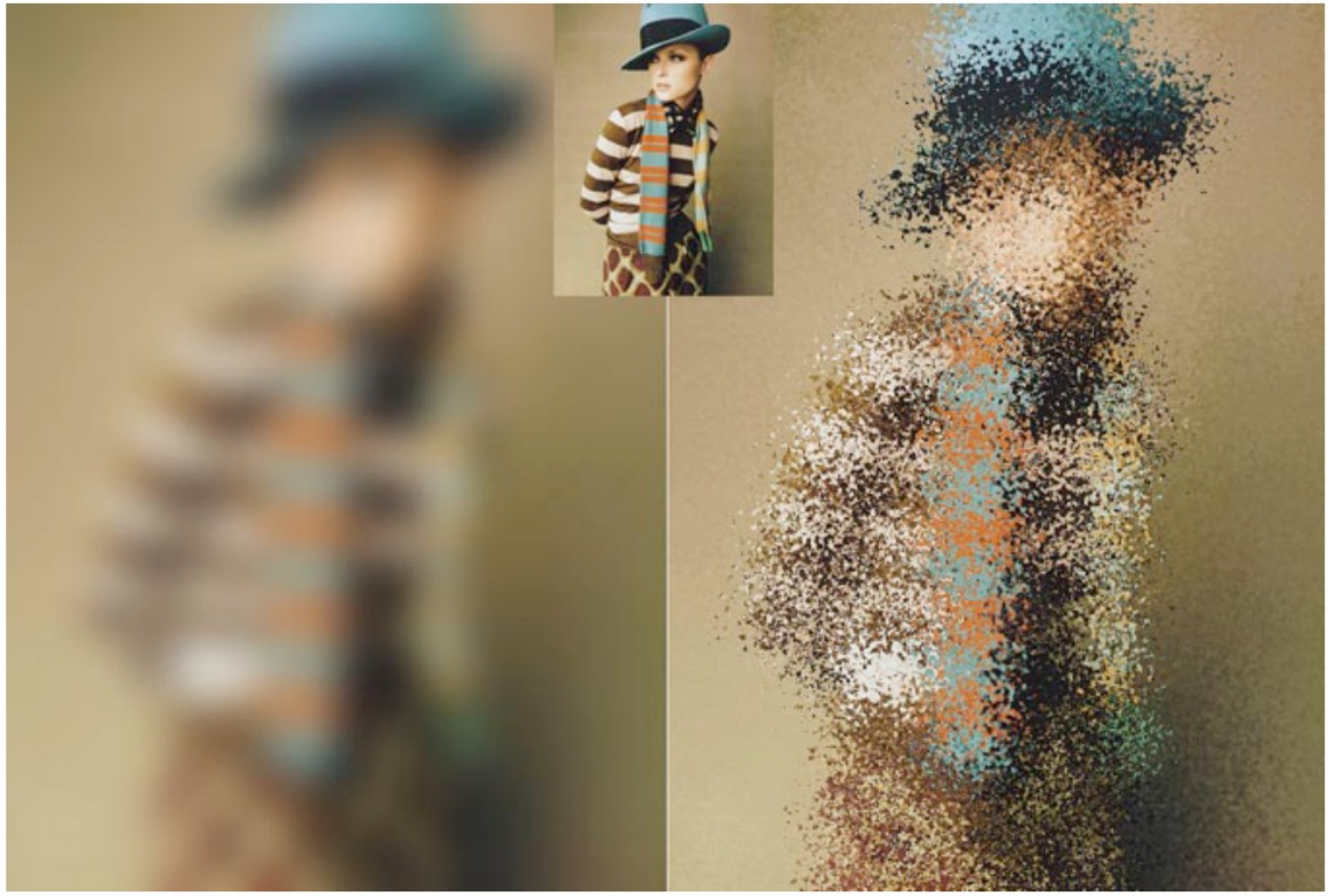
Light

Light


Initial
Gradient Map
Local Minimum
Light
Sparse

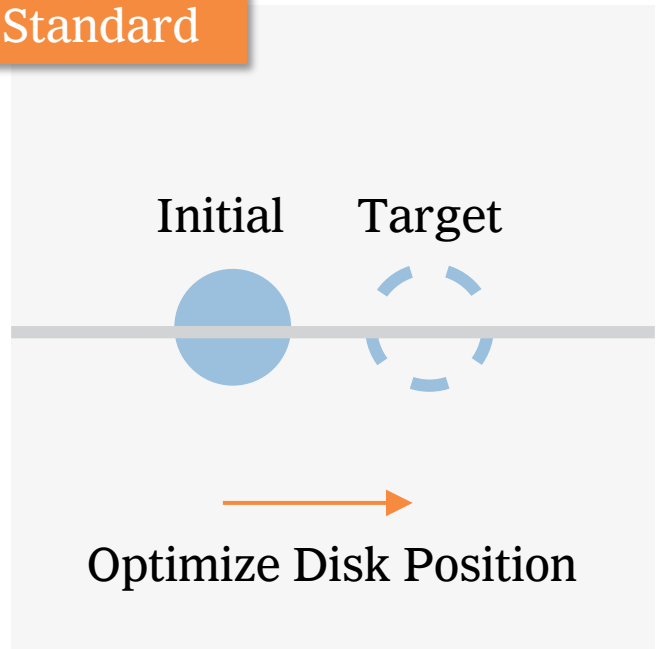

Initial
Gradient Map
Ours
Light
Sparse

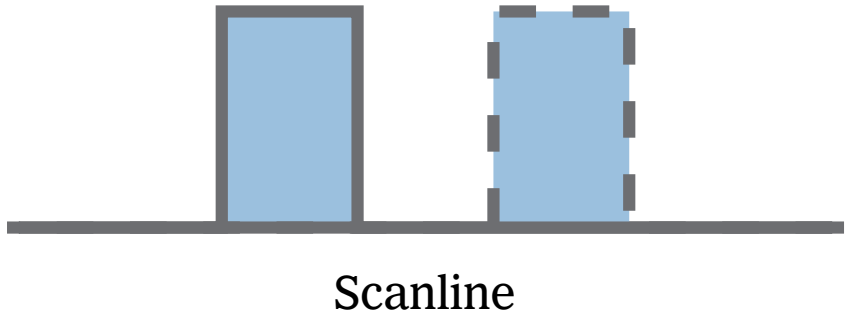
Locally Orderless Images

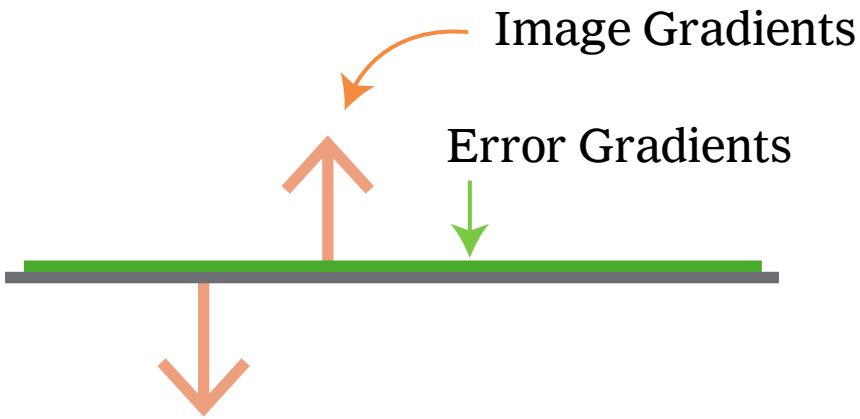


Koenderink and Doorn, The Structure of Locally Orderless Images, IJCV 1999
Griffin, Scale-Imprecision Space, Image and Vision Computing 1997

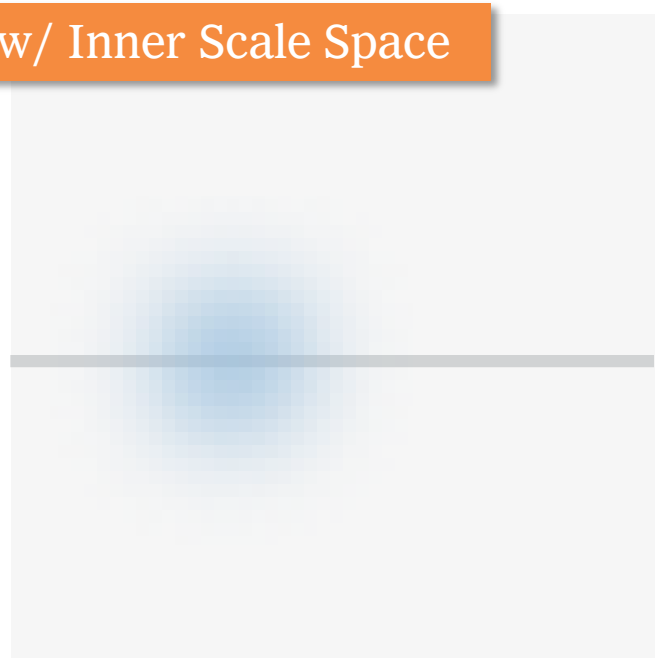
Standard

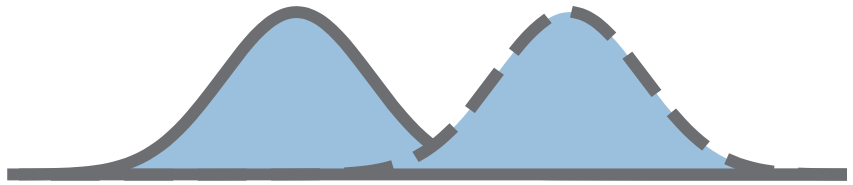


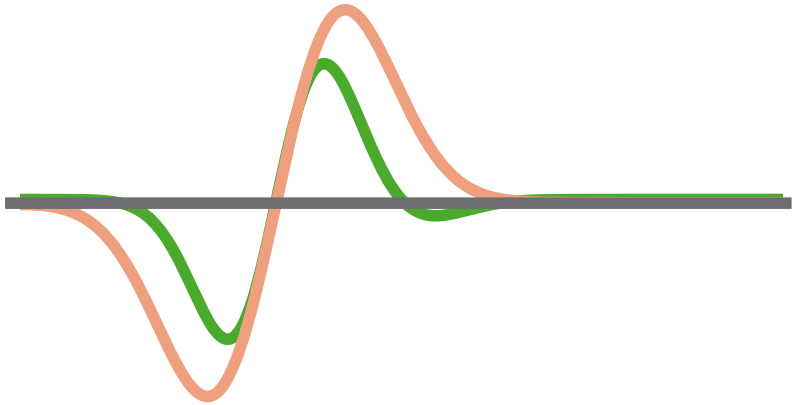




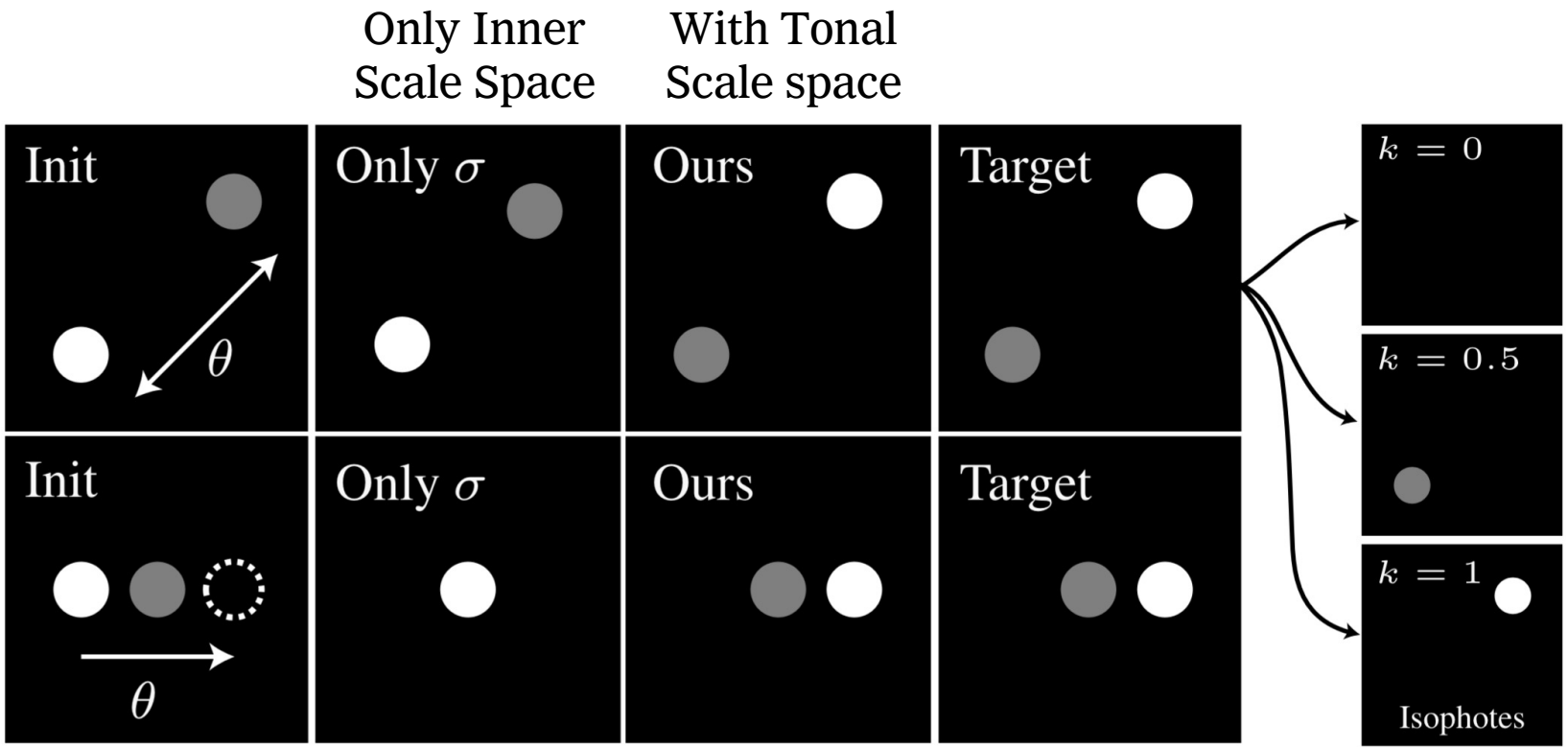
w/ Inner Scale Space



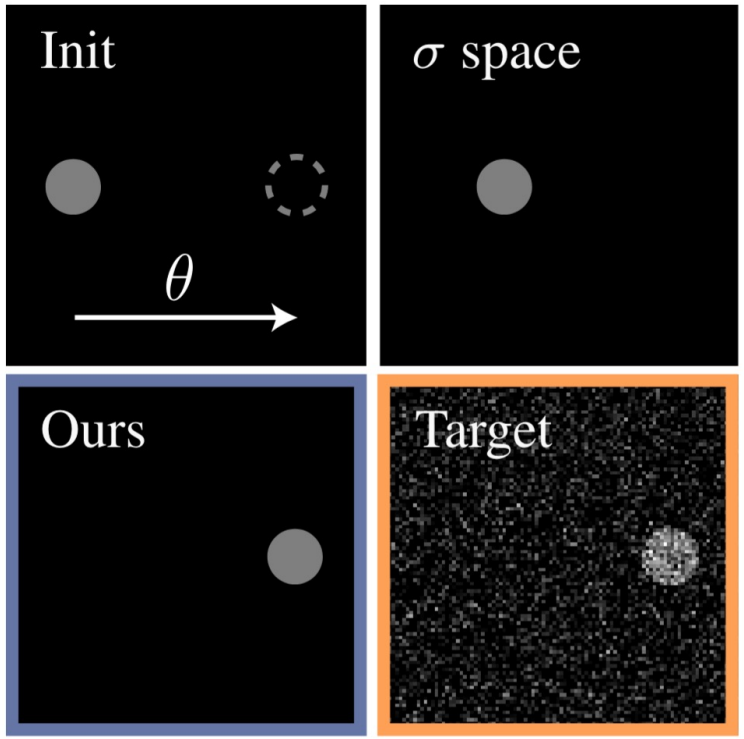


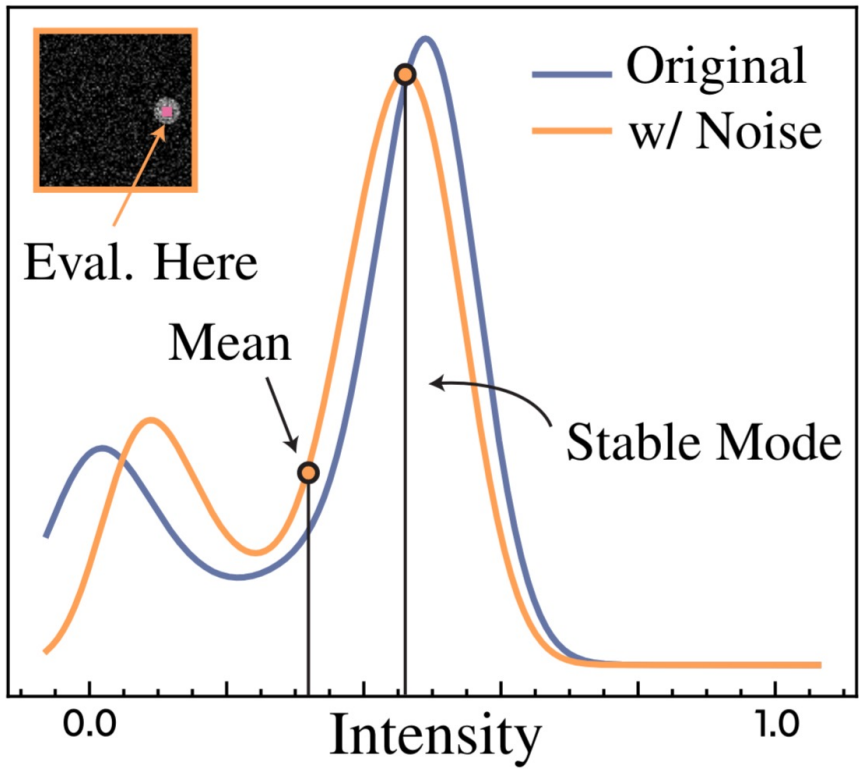


Key Takeaway: Scale-space matching extends gradient support.

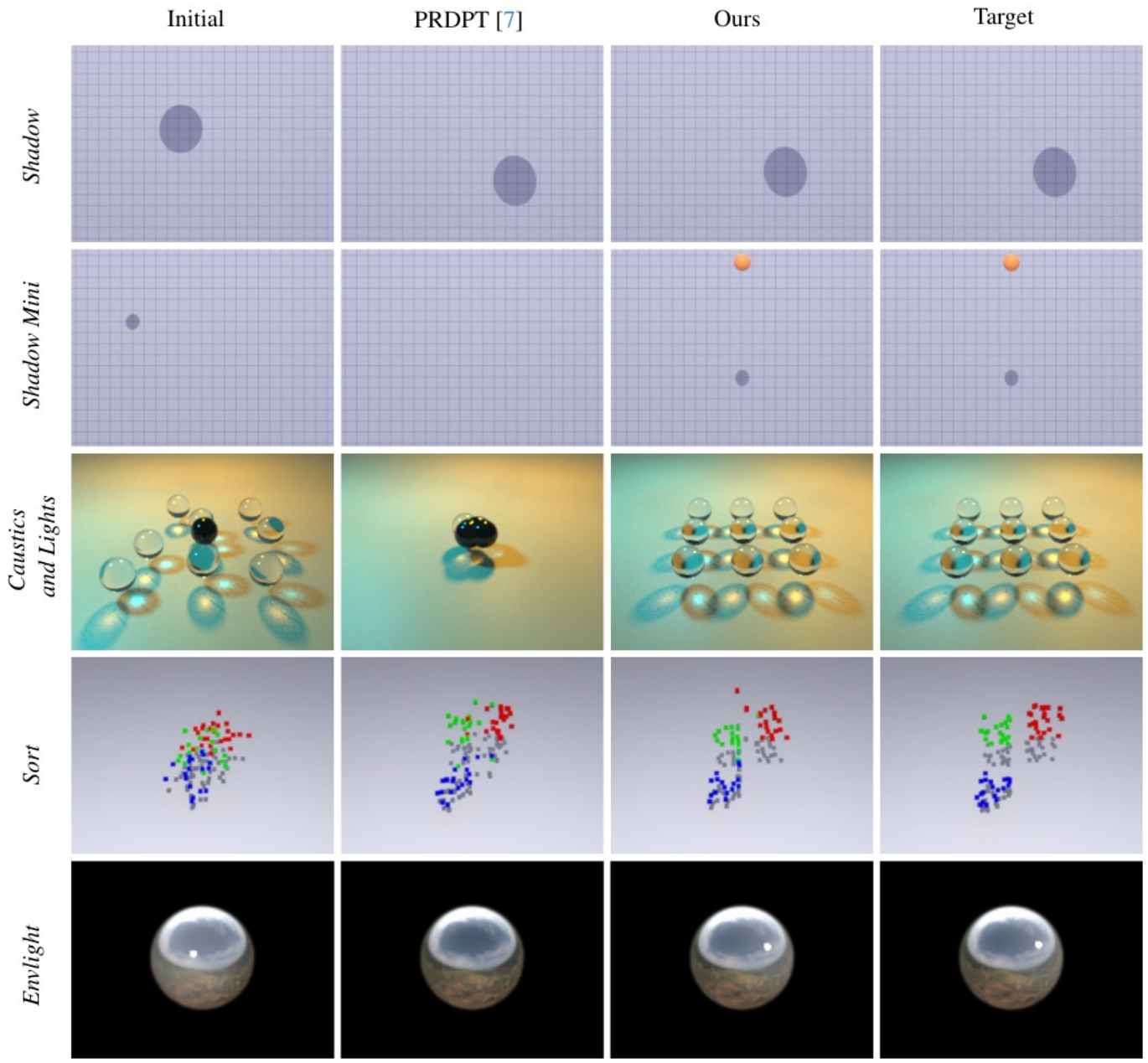


Key Takeaway: LOIs induce tonal separation.

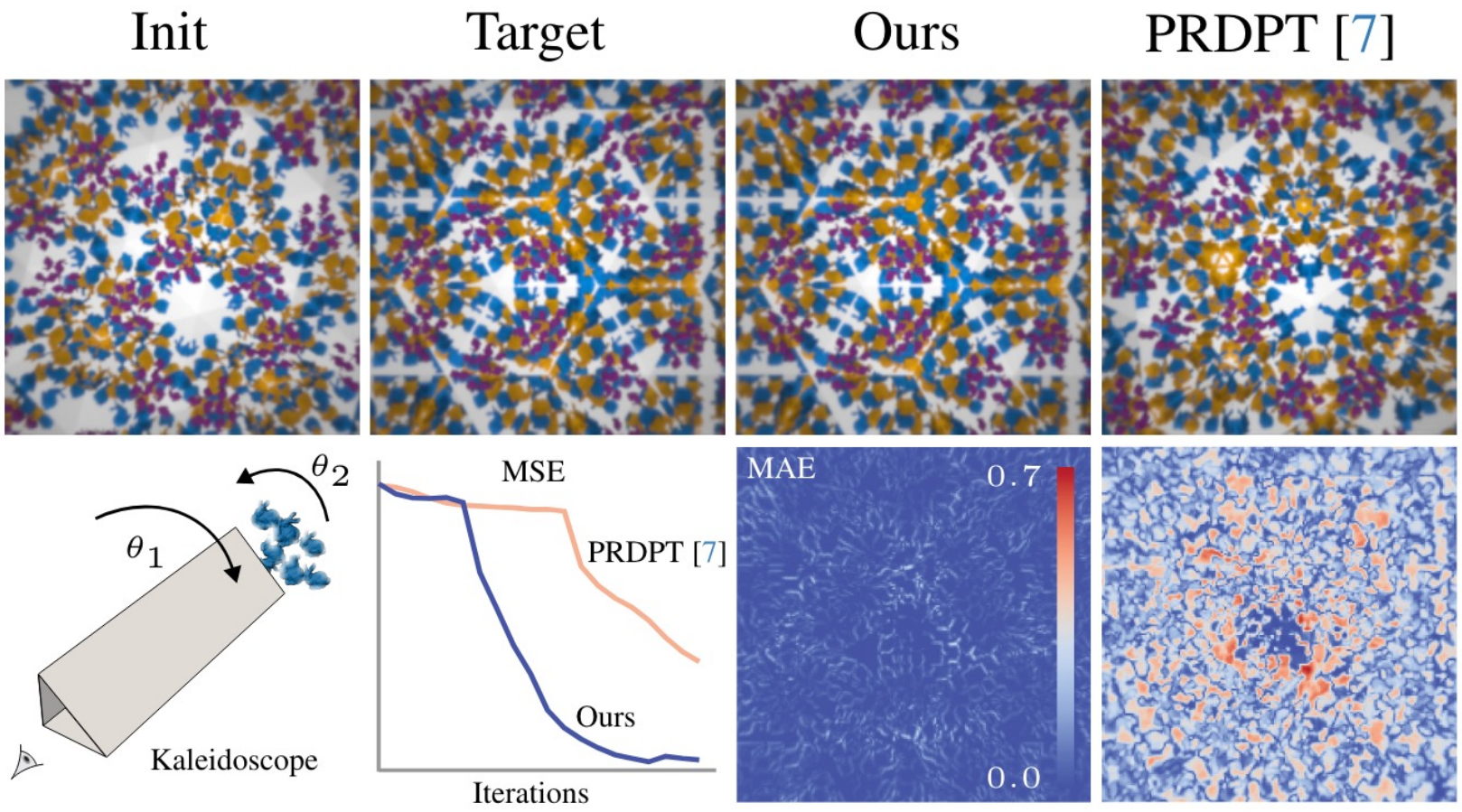




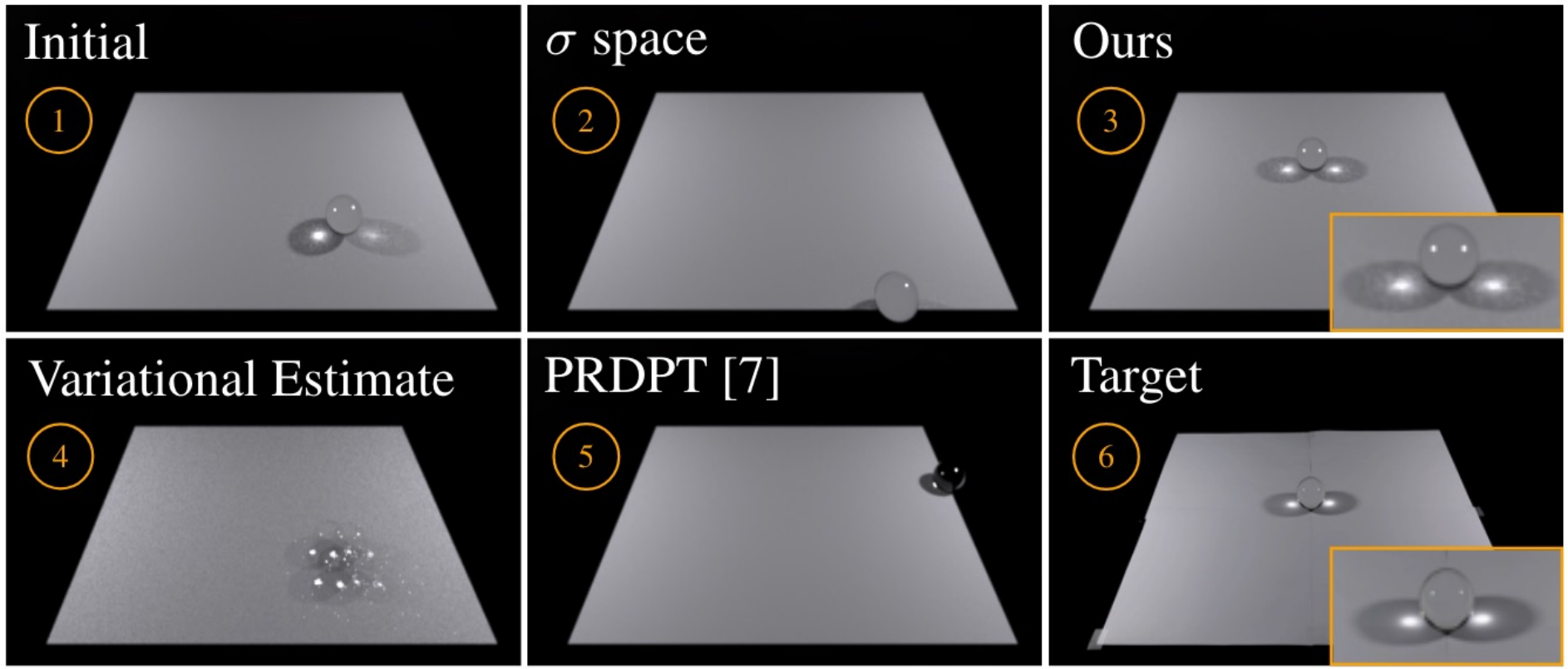
Key Takeaway: Extent scale-space matching is more robust in presence of noise.



Key Takeaway: We show results on a variety of inverse rendering problems.



Key Takeaway: Our method is compatible with variational optimization.



Key Takeaway: Our method is robust in presence of sensor noise and calibration errors.

Project Page

https://ishit.github.io/loir/