**Use of a neural network to control an adaptive optics system for an astronomical telescope**

**用神经网络控制天文望远镜的自适应光学系统**

1.在Direct determination中哪里提到该文章

In adaptive optics, deep learning was initially applied to astronomical telescopes [18–20]

2.Direct determination如何总结该文章

In adaptive optics, deep learning was initially applied to astronomical telescopes [18–20]

3.该文章逻辑是什么

第一段简要介绍装置及优势

第二段介绍神经网络内容

第三段神经网络内容

第四段提到实验中用了Zernike方程，小于10

第五段实验具体仪器

第六段放大信噪比内容

第七段湍流的设定

第八段介绍Fig3，定性描述神经网络准确性

第九段介绍Fig4，定量描述神经网络准确性，Zernike4-7

第九段介绍Fig4，定量描述神经网络准确性，Zernike8以上，虽然难对比，但是仍然较为准确

第十段总结

4.该文章核心是什么？

利用一对对焦和离焦的天文望远镜图片进行神经网络训练，可测定有天文涡流造成的低倍相差

5.英语表达该文章核心

With the neural network training of pairs of in- and out-of-focus images from atmospheric telescope，we can measure low-order distortion created by atmospheric turbulence.

6.积累的问题

PSF

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Zernike

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<http://www.optics.arizona.edu/sites/optics.arizona.edu/files/pdf/Historical-Development-Shack-Hartman-Wavefront-Sensor.pdf>

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剪切干涉仪shearing interferometer

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