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MISSING SEYFERT GALAXIES

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RESUMEN

El objetivo de este trabajo es la estimación del número de galaxias Seyfert *faltantes* debido a la ocultación por el polvo del disco de las galaxias espirales. Comparamos la distribución de las inclinaciones de las galaxias anfitrionas de las Sy1s y Sy2s con la de la muestra de control de las galaxias espirales. Encontramos que el número relativo de galaxias Seyfert es mayor para las Seyfert vistas de frente, en las galaxias con $i < 30°$, y es menor en las galaxias muy inclinadas con $i > 61°$ que en las galaxias espirales sin núcleos activos. Concluimos que la diferencia observada se debe a la absorción de los núcleos Seyfert en el disco de polvo de las galaxias inclinadas. Estimamos que las Seyfert faltantes son alrededor del 100% para las Sy1y y del 50% para las Sy2s.

ABSTRACT

The aim of this work is to estimate the number of Seyfert nuclei missing in catalogs due to obscuration by the dust disc in host spiral galaxies. We compared the distribution of inclinations of host galaxies of Sy1s and Sy2s with that of in control sample of spiral galaxies, and found that the relative number of Seyferts is higher in almost face-on galaxies with $i < 30°$ and smaller in highly inclined, $i > 61°$, spiral galaxies without active nuclei. We conclude that the difference found is due to absorption of the Seyfert nuclei by the dust-disc of inclined galaxies. We estimate that about 100% and 50% of the observed Sy1s and Sy2s respectively are missing.

Key Words: galaxies: Seyfert

1. INTRODUCTION

According to the Unified scheme (Miller & Goodrich 1990; Antonucci 1993; Urry & Padovani 1995), the difference between Sy1 and Sy2 galaxies is caused by the orientation of the inner dust torus in relation to the observer. If the opening angle of the torus is pointing towards the observer, and the active galactic nuclei (AGN) with the broad line region (BLR) is directly seen, the galaxy is classified as Sy1. If the orientation of the torus is such that the BLR is hidden, and only the narrow line region is observable the galaxy is classified as Sy2. The ratio of the numbers of Sy1 and Sy2 galaxies determines the opening angle of the putative dust torus. In order to understand the nature of Seyferts it is also important to know the frequency of their occurrence among galaxies.

Numerous efforts have been made in compiling new a large list of Seyfert galaxies (e.g., Huchra 1977; Véron-Cetty & Veron 2010, and references therein). Some Seyfert nuclei, however, may not be revealed because they are hidden behind the galactic dust-disc. Indeed, Keel (1980), Kirhakos & Steiner (1990), McLeod & Rieke (1995) found, that Seyfert nuclei avoid edge-on galaxies. Malkan, Gorjian, & Tam (1998) also found dust lanes and patches in the central regions of Seyferts. Driver et al. (2008) showed that the role of absorption of starlight by dust grains in galactic discs is substantial. Therefore, the emission of the AGN may be completely hidden by the dust-disc in some highly inclined spiral galaxies, and a certain number of Seyferts may be missing. The real ratio of the numbers of Sy2 and Sy1 galaxies may be altered, and consequently the value of the opening angle of the dust-torus in the Unified scheme may be in error.

It has been suggested that the activity of the galactic nucleus may be triggered by dense envi-

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