Clarifications to the paper “Holographic characteristics of a 1-mm-thick photopolymer to be used in holographic memories”

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We have corrected typing errors related to the characterization of the dynamic range of the acrylamide photopolymer described in an earlier study [Appl. Opt. **42**, 7008 (2003)]. The M number is expressed as $M/\#$ instead of $M\#$ as appears in the text. The value calculated from the experimental results that are included in the article is $M/\# = 3.8$ instead of 38 as appears in the text. © 2005 Optical Society of America
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The M number characterizes the dynamic range of a holographic recording medium and enables the holographic data-storage capacity of different types of materials to be compared. It was introduced by Mok *et al.*¹ and was originally expressed as $M/\#$. In our earlier study² it appears as $M\#$. It is defined by the following expression:

$$\eta = \left(\frac{M/\#}{M} \right)^2. \quad (1)$$

For a large number of holograms, M is the number of holograms recorded by means of multiplexing and η is the equalized diffraction efficiency. From Fig. 8 in our earlier study² it is possible to calculate the experimental value of the dynamic range used to record the nine holograms by the expression

$$M/\# = \sum_{i=1}^M \eta_i^{1/2}, \quad (2)$$

where η_i represents the maximum diffraction efficiency reached by each hologram in the reconstruction

Table 1. $DE_{\max}$, η_i , and $\eta_i^{1/2}$ for Each Hologram in Fig. 8 of Ref. 2

Hologram	$DE_{\max}$ (%)	η_i	$\eta_i^{1/2}$
1	15.62	0.1562	0.3952
2	18.13	0.1813	0.4258
3	23.85	0.2385	0.4884
4	20.51	0.2051	0.4529
5	32.16	0.3216	0.5671
6	20.66	0.2066	0.4545
7	21.16	0.2116	0.4600
8	7.29	0.0729	0.2700
9	8.87	0.0887	0.2978

tion and $M = 9$. Table 1 shows the $DE_{\max}$ values represented in Fig. 8 of Ref. 2 and the corresponding η_i , $\eta_i^{1/2}$ for each hologram. From the sum of this last column, we obtain $M/\# = 3.8$, a value considered correct by Ihas *et al.*³ This explains the typing error in the paper cited in which it is stated that $M/\# = 38$.

To give an example related to the recording that we carried out, to obtain $M/\# = 38$, it would be necessary, according to Eq. (2), to record 85 holograms with $\eta_i = 0.2$ or 170 holograms with $\eta_i = 0.05$.

References

1. F. Mok, G. W. Burr, and D. Psaltis, “System metric for holographic memory systems,” *Opt. Lett.* **21**, 896–898 (1996).
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3. B. C. Ihas, A. J. Hill, and M. Schnoes, “Comment on ‘Holographic characteristics of a 1-mm-thick photopolymer to be used in holographic memories,’” *Appl. Opt.* **43**, 4017 (2004).

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