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CORRIGENDUM TO "INSERTION-OF-FACTORS-PROPERTY WITH FACTORS MAXIMAL IDEALS" [J. KOREAN MATH. SOC. 52 (2015), NO. 3, PP. 649–661]

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In [2], the proof of Proposition 1.9 is incorrect in part, and so we here provide a correct proof.

Proposition 1.9. *If R is an IMIP ring, then eRe is IMIP for all $0 \neq e^2 = e \in R$.*

Proof. Let R be an IMIP ring and $0 \neq e^2 = e \in R$. Suppose $ab = 0$ for $a, b \in eRe$. Then $ae = a$ and $eb = b$. Since R is IMIP, $aMb = 0$ for some maximal ideal M of R. Note $aMb = aeMeb$. If $eMe = eRe$, then $aNb = 0$ for all maximal ideals N of eRe. So assume $eMe \subsetneq eRe$. Since $eMe \subseteq (eRe)M(eRe) = eRe(RMR)eRe$ and $eRe(RMR)eRe \subseteq eMe$, we have

$$eMe = eRe(RMR)eRe.$$

We next show that eMe is a maximal ideal of eRe. One can find the proof by help of [1, Theorem 3], but we here write another one. Assume that $eMe \subsetneq N_1$ for some ideal N_1 of eRe. Then

$$N_1 = eReN_1eRe = eRN_1Re,$$

since $eN_1e = N_1$.

We claim here that $RN_1R + RMR \supsetneq RMR$. Assume $RN_1R + RMR = RMR$. Then

$$\begin{aligned} eMe &= eRe(RMR)eRe \\ &= eRe(RN_1R + RMR)eRe \\ &= eReRN_1ReRe + eReRMReRe \\ &= N_1 + eMe = N_1 \end{aligned}$$

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because N_1 contains eMe. This contradicts $eMe \subsetneq N_1$. But $M(= RMR)$ is maximal in R, so we have $RN_1R + RMR = R$. This result yields

$$N_1 = eReN_1eRe = e(RN_1R)e = e(RN_1R + RMR)e = eRe,$$

by the preceding argument. Thus eMe is a maximal ideal of eRe. Moreover $0 = aMb = a(eMe)b$ since $a = ae$ and $b = eb$, proving that eRe is IMIP. $\square$

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