On matrix and polynomial extensions over generalizations of Armendariz rings

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This paper deals with generalizations of Armendariz rings, so called weak Armendariz rings. A ring R is called Armendariz if $f(x)g(x) = 0$ implies $a_i b_j = 0$, for all polynomials $f(x) = \sum_{i=0}^{n} a_i x^i$ and $g(x) = \sum_{j=0}^{m} b_j x^j$ from $R[x]$. A ring is called a weak-Armendariz if $f(x)g(x) = 0$ implies $a_i b_j \in \text{nil}(R)$. Recall that generalization of Armendariz and rigid ring is σ-skew Armendariz ring. Ring R is called σ-skew Armendariz if $f(x)g(x) = 0$ implies $a_i \sigma^i(b_j) = 0$, for all $f(x) = \sum_{i=0}^{n} a_i x^i$ and $g(x) = \sum_{j=0}^{m} b_j x^j$ from $R[x; \sigma]$. As a generalization of σ-skew Armendariz rings, there is a notion of weak σ-skew Armendariz ring R as a ring in which $f(x)g(x) = 0$ implies $a_i \sigma^i(b_j)$ is the nilpotent element of R for all $f(x) = \sum_{i=0}^{n} a_i x^i$ and $g(x) = \sum_{j=0}^{m} b_j x^j$ from $R[x; \sigma]$. We construct weak Armendariz structure which is preserved under ring isomorphism. Our main result is that Armendariz property can be transformed from the ring to its matrix or polynomial extension. In this paper we generalize some results which are related to σ-skew Armendariz rings, to the weak σ-skew Armendariz case. Central Armendariz rings are also considered.

References

[1] D. Jokanović, Properties of Armendariz rings and weak Armendariz rings, Publ. Inst. Math. (Beograd) (N.S.) **85**(99) (2009), 131–137.

[2] H. Pourtaherian, I. S. Rakhimov and S. H. Sapar, On Hilbert property of ring, International Journal of Algebra **5**(7) (2011), 301–308.

[3] H. Pourtaherian and I. S. Rakhimov, On Armendariz Ring and its generalizations, JP Journal of Algebra, Number Theory and Applications **15**(2) (2009), 101–111.

[4] L. Ouyang, Extensions of generalized α-rigid rings, Int. Electron. J. Algebra **3** (2008), 103–116.

[5] L. Liu and R. Zhao, On weak Armendariz rings, Comm. Algebra **3**4(7)(2006), 2607–2616.

[6] M. R. Rege and S. Chhawchharia, Armendariz rings, Proc. Japan Acad. Ser. A. Math. Sci. **73**(1997), 14–17.

[7] W. Chen and W. Tong, On skew Armendariz and rigid rings, Houston J. Math. **33**(2) (2007), 341–353.